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Big Data, Big Libraries, Big Problems?: the 2014 LibTech Anti-talk?

It is precisely the emotive traits that are rewarded: the voracious lust for understanding, the enthusiasm for work, the ability to grasp the gist, the empathetic sensitivity to what will attract attention and linger in the mind.

Unable to compete when it comes to calculation, the best workers will come with heart in hand.

--David Brooks, commenting on the book *The Second Machine Age*¹

To Sheila, beloved wife and mother of five precious boys, who is too busy to read this by virtue of investing in more lasting and consequential matters.

Short promotional blurb:

What do you know about technologies like the Semantic Web, Big Data, and MOOCs - phenomena libraries are increasingly becoming involved with? Is it "all good"? Why are we sometimes fearful about new technologies and the power they present to us, seen for example in pop-culture icons such as HAL, the Daleks, and the Borg? If you are one who wants to look at technology and its effects with a critical eye, this time of meandering philosophical reflection and questioning might be for you.

Longer promotional blurb:

Did you ever have a cataloging class called "The organization of knowledge"? Can knowledge be externalized as such a title might seem to suggest? In what sense might libraries – and even things like writing – be seen as “technologies”? What might this have to do with phenomena libraries are increasingly becoming involved with - things like the Semantic Web, Big Data, and even MOOCs? Are these things "all good"? Why are we sometimes fearful about new technologies and the power they present to us, seen for example in pop-culture icons such as HAL, the Daleks, and the Borg? Is any fear – and moral concern – really justified? And if so, why? If you are one who wants to look at technology and its effects with a critical eye, this time of meandering philosophical reflection and questioning might be for you. From the librarian who brought you “Wikipedia: the educator's friend (!)” (2010) and “Teaching with Google Books: research, copyright, and data mining” (2012)

Abstract:

The desire to create automatons is a familiar theme in human history, and during the age of the Enlightenment mechanical automatons became not only an “emblem of the cosmos”, but a symbol of man’s confidence that he would unlock nature’s greatest mysteries and fully harness her power. And yet only a century later, automatons had begun to represent human repression and servitude, a theme later picked up by writers of science fiction. Man’s confidence undeterred, the endgame of the modern scientific and technological mindset, or MSTM, seems to be increasingly coming into view with the rise of “information technology” in general and “Big data” in particular. Along with those who wield them, these can be seen as functioning together as a “mechanical muse” of sorts – surprisingly alluring – and, like a physical automaton can serve as a symbol – a microcosm – of what the MSTM sees (at the very least in practice) as the cosmic machine, our “final frontier”. And yet, *individuals who unreflectively participate in these things – giving themselves over to them and seeking the powers afforded by the technology apart from technology’s rightful purposes – in fact yield to the same pragmatism and reductionism those wielding them are captive to. Thus, they ultimately nullify themselves philosophically, politically, and economically – their value increasingly being only the data concerning their persons, and its perceived usefulness.* Likewise libraries, the time-honored place of, and symbol for, the intellectual flowering of the individual, will, insofar as they spurn the classical liberal arts (with the idea that things are intrinsically good, and in the case of humans, special as well) in favor of the alluring embrace of MSTM-driven “information technology” and Big data - unwittingly contribute to their irrelevance and demise as they find themselves increasingly less needed, valued, wanted. Likewise for the liberal arts as a whole, and in fact history itself, if the acid of a “science” untethered from what is, in fact, good (intrinsically), continues to gain strength.

Executive Summary

In the Appendix which follows the body of this paper (before the Selected Works page) ***there is a six page article which summarizes this paper’s more salient points in a op-ed-style fashion. It is also more directly to the point, more blunt*** (the longer paper is more meandering and builds up more slowly) Some readers may choose to look at the Appendix first.

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Preface

Technology conferences are always so optimistic about new technologies and the direction we seem to be going with them. And here I am.

But I have enjoyed the journey here – getting ready for today has been a real adventure with lots of interesting twists and turns – and I hope you will enjoy today, even as mine is a not a feel good message.

I am really happy to be here today. That said, this will be my third talk at this conference and probably my last. Speaking as a father, I know my kids also value me and any contributions I can make more than most – most days that is – and I know I need to give more time to those who love me. End of personal note.

Another interesting note related to today: when one looks at the evidence, one might conclude that Technology does not like me. Again, I have been at three conferences like this, and here two times, in 2010 and 2012. All three times I have been at technology conferences I have had some major issues with technology – despite arriving with plenty of time to set up. I thought about not even doing a PowerPoint this year but decided to go through with it.

In any case, this talk is my revenge. Mwwwwahahahahahaha!

Just kidding – I’m really not bitter. I try to take my faith in God seriously, and as one who has forgiven much, much can be forgiven. That said, I do have some hard words for Technology, and, given the occasion of this talk, being at a technology conference and all that, I have decided to error on the side of too many criticisms.

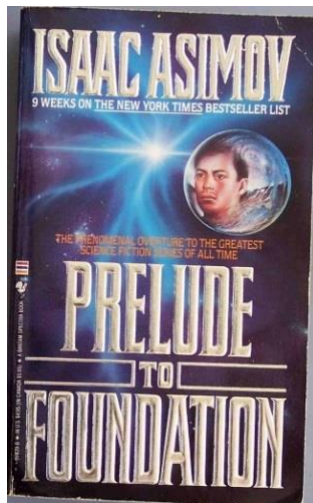
Some persons might question the wisdom of my doing this, but I have been thinking about these things for a long while now and I really would like to lay all my cards out on the table. If you appreciate persons like Neil Postman, Sherry Turkle, Nicholas Carr and Jaron Lanier, you *may* like me. Or, if you can stomach those persons, you *may* be able to stomach me.

Please know that my goal is to not to be some kind of alarmist, although I realize it might possibly come off that way to some. For me, arrogant as this may sound, all of the things that I am saying seem rather obvious and I've come to some terms with them. I simply want to promote an increased awareness of some things that seem very clear to me. Obviously, I don't know the future of all things technological, nor am I opposed to all technology. In fact, I have a son on the autism spectrum, and it looks like he might very well end up being a computer hardware engineer or something. What I simply want to encourage here today is reflective thought about the long term. Changes certainly will be coming in the near future or not so near future, and I think either way there are some hard questions that people in general and librarians in particular should be thinking about.

Please note that I also have a theology degree and think that field is more relevant – not less relevant – in today's world. Therefore, this paper/presentation is admittedly informed by traditional Christian faith even as it is a *secular meditation for librarians* (and others as well) – one that I trust most folks will find somewhat amenable and reasonable. (I would point out that as books like Charles Taylor's *A Secular Age* show, the word secular need not – and really should not – have anti-religious connotations). For those wanting to get a deeper sense of how my religious faith has informed this presentation, *the footnotes have more of that information*.

So with that lengthy preface and heads up, we proceed.

Introduction



Gaal Dornick, using mathematical concepts, has defined psychohistory to be that branch of mathematics which deals with the reactions of human conglomerates to fixed social and economical stimuli....
– Isaac Asimov, *Foundation*²

This paper is concerned with the role of technology in libraries – especially particular modern forms of technology. *Of even greater concern however, are the philosophes that underlie the use [and certainly in some cases the creation] of these technologies. Much of this paper is devoted to exploring those philosophies in no small depth, and at some leisure, and the message, although for libraries, has broader application (again, if you want a more rapid, “get-to-the-point” approach, please proceed to the “Executive Summary” in the Appendix).*

Context is king and so I proceed to set the frame. While the ancient world had some notions of order in the universe, the predominant motifs were those of chaos and fate (which has negative connotations).

This is no longer the case.³ Now, the predominant themes, led by the “West”, are those of progress and destiny (which is similar to fate, but has largely positive connotations).

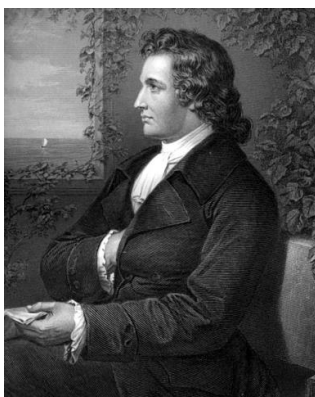
Many years ago, I was reading Isaac Asimov’s fictional *Foundation* series and was introduced to the character of Hari Seldon. This man develops a science called “psychohistory” that enables him to predict the future via probability using mathematical formulas.⁴ As an impressionable sixteen year old, this was a very new idea for me at the time and had a real impact on me – I vividly remember the time and place I read this and my subsequent wrestling with the concept: was science really progressing such that it would have abilities like these? Or if it was not, could it?⁵

Recently, I came upon what is by now a familiar theme - the universe as a machine, albeit a beautiful one – in the book *The Invention of Hugo Cabret*⁶. As opposed to Hari Seldon’s formula(s), which took into account contingencies (and hence probabilities), what we find in *Hugo Cabret* certainly *seems* to be a more deterministic way of looking at things. Whether or not this is the case, here I submit that the practical idea is the same: *by treating the cosmos as a machine and by carefully observing it, mathematical formulas can assist in “capturing” the world and be used to make predictions about it.*⁷

It would perhaps seem to be the height of foolishness to deny the full truth of such a statement. Even so, it has evidently seemed to many over the years that there is a great, great cost that comes with this analogy. Noting the continual ascent of the scientific worldview in the late 18th century, the great German writer, Johann Wolfgang von Goethe believed that



Poster for the movie version



Johann Wolfgang von Goethe

“the Renaissance ideal of classical languages, classical literature, and classical arts *would be replaced by classical mechanics, which have no place for meaning, ethics, or Bildung* [that is, the “tradition of self-cultivation, wherein philosophy and education are linked in a manner that refers to a process of both personal and cultural maturation”⁸]. In science and technology, every tool would be used to maximize the power of human being.”⁹

What was Goethe afraid of? Why did he see things this way?¹⁰ How does this relate to big data? And why should libraries care?

We’ll get there. For now though, let’s start our journey by way of something that fascinates many if not all of us - robots.

I. The Promise and Peril of Automata

*“O had I Father’s gift I would breathe life
Into the lifeless earth, but who are we*

*To recreate mankind?
-Ovid, Metamorphoses¹¹*

Or, perhaps if we are not limiting ourselves to our age of modern science, we could say “automata”, that is, “anything capable of acting automatically or without an external motive force”.¹² In sum, man has



Some of Jaquet Droz's automats

always wondered about creating life – first by means of magic, and in today's age, by means of science.¹³ The ancient world is full of stories about objects created by man that move and seem to have a life of their own. Sometimes these were imagined as vessels that were used by the gods and other times simply as the servants of man. In medieval times, efforts to create a man were not unknown, and this is even where we get the term golem, that is “the figure made into the form of a human and given life; the creature is then slave to its master's commands”.¹⁴

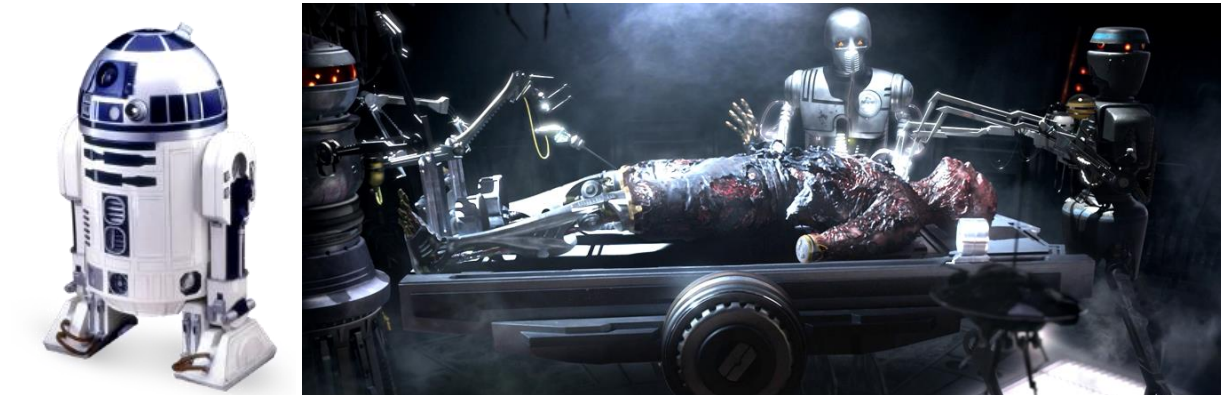
With the dawn of the age of modern science in the 17th c., men like Jaquet Droz captured the attention of many with his human-like “automatons” (this now being the modern, scientific sense of the term). *Men like Descartes and Leibniz even used the automaton as an “emblem of the cosmos”, and this both summed up and fueled what I would characterize as the modern scientific and technological mindset, or MSTM¹⁵ – where the boundaries limiting man's power over nature increasingly were expected to succumb.* With all this optimism then, it was perhaps surprising that only a century later that “automata instead represented repression and servitude.”¹⁶

According to fantasy and horror author – *and literary scholar!* – Kang Minsoo, author of *Sublime Dreams of Living Machines: The Automaton in the European Imagination*, automata are fascinating to us for reasons that could be said to be both “essential” and “historically contingent”. I won't go into detail about this here, but suffice it to say that current fascination has to do with unease as much as awe and wonder.¹⁷ And no wonder – even as scientists in the 19th c. were themselves idealized as dispassionate objects probing the natural world, machines seemed to burst forth in full color more and more so – as they gradually encroached on the territory that had previously only been man's domain (more on this later)¹⁸



As far as fiction goes, exceptions to the rule....

We see all of this reflected especially in the genre of science fiction, particularly in the 19th century. H.G. Wells is one of the best known authors here. Of course nowadays we see both positive and negative robots reflected in our fiction, particularly of the kind that comes out of Hollywood. That said, the robots that threaten us loom larger, it seems to me.



“The cheerful and supportive R2-D2 does not accurately reflect the prevailing interpretation of robots in Euro-American film” – Robert Geraci.¹⁹ Think Darth Vader.

Technology writer Chris Baraniuk adds some more insight here. He notes that where early machines or cyborgs in 19th c. literature would struggle with philosophical questions, early 20th century fictional robots were typical silent killing machines, something that he says, “of course, evolved from a specific matter”, namely, the “mindless mechanisms of Victorian engineering” - “senseless industrial machines that took many lives during that time period”.²⁰ Since this time, the presentation of robots in [science] fiction has generally become more nuanced, where, as Robert Geraci notes, “fear of technological wrath accompanies the hope of a new Eden”.²¹ In science fiction the MSTM (again, the “modern scientific and technological mindset”) is celebrated, even as man’s technological accomplishments bring peril as well as promise.



“Human beings relations with artificial intelligence parallel their relations with the Holy”-- Geraci²²

To many of us, this might bring to mind “Artificial Intelligence” (today the original idea of what AI would be is subsumed in the term “Artificial General Intelligence” or AGI), which I won’t spend too much time on here. Suffice it to say, I have read *Our Final Invention* by writer and PBS documentarian James Barrat, whose reason for writing the book is to raise awareness of the imminent dangers of “self-aware and self-improving machines”. He worries not so much about a “handover of power” to machines but rather

a takeover – something that a few in the Artificial Intelligence community have some real concern about.

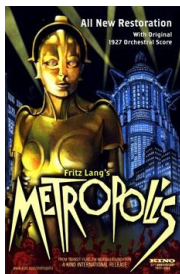
Here is the sum of his and other's concerns about the potential for "Artificial Super Intelligence", or ASI, condensed in a science fiction horror scenario befitting of a book with the title *Our Final Invention*:

"Through it all, the ASI [Artificial Super Intelligence] would bear no ill will toward humans nor love. It wouldn't feel nostalgia as our molecules were painfully repurposed. What would our screams sound like to the ASI anyway, as microscopic nano assemblers mowed over our bodies like a bloody rash, diassembling us on the sub-cellular level?

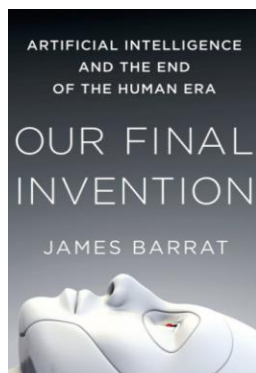
Or would the roar of million and millions of nano factories running at full bore drown out our voices? (16)... it does not have to hate us before choosing to use our molecules for a purpose other than keeping us alive (18, 19)"



*Daleks, from Doctor Who:
"Exterminate! Exterminate!
You will be ex-ter-mi-na-
ted!"*



Yes, more typical



More mainstream daily

I won't go into detail about my own reasons for not taking these very MSTM-driven ideas of self-aware²³ A.I. too seriously (see footnote²⁴), but suffice it to say, I think this bit from A.I. scientist Eliezer Yudkowsky, expresses well one of the main reasons why many in the A.I. community take it seriously:

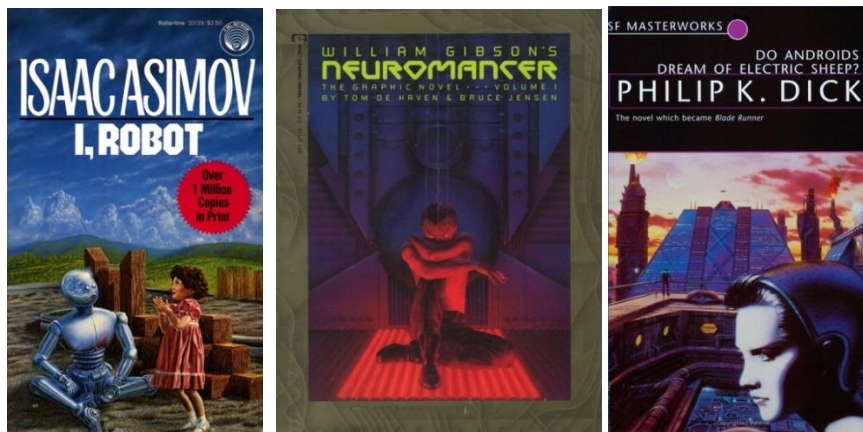
"Natural selection is stupid. If natural selection can solve the AGI [Artificial General Intelligence] problem, it cannot be that hard in an absolute sense. Evolution coughed up AGI easily by randomly changing things around and keeping what worked. It followed an incremental path with no foresight." (p. 199)²⁵

And with that, it seems to me an apropos time to quickly take a look at what some have suggested, after undertaking a historical study, have been some of the various reasons and motives for trying to create automatons. Although there are no doubt some who would consider this a waste of time (not empirical enough, etc.), perhaps thinking critically about these might help us a bit more in our own self-reflection:

- "the urge for technical control of the environment" (psychologist John Cohen, author of the 1966 book *Human Robots in Myth and Science*, p. 95²⁶)

- “the impulse to delve into the mysteries of nature” (Cohen, 95)
- “robots... [are] incapable of offering the slightest resistance” (Cohen, 95)
- no need to deal with human servants (Aristotle),²⁷ or to make the perfect woman²⁸
- “[the desire to] create a man is but a way of challenging the supremacy of the gods” (Cohen, 105)²⁹
- more³⁰

Curiously, the simple joy that man has in being creative – which I see in my own son all the time as regards his mechanical creations – is generally not mentioned by Cohen or others as a possible reason for the attempt to create automata, to create life. Regarding the themes listed above, as we proceed in our journey, I suggest that they do indeed come up time and again – albeit more implicitly than explicitly.



In fiction, we see recurring themes of fear and fascination, damnation and salvation combined....³¹

At this point though, let's broaden our focus by examining the connection of modern automata and Big data and then by looking at the idea of “technology” in general. And yes, we will be talking about the connection of these things with libraries as well.

II. Automata in the Age of Big Data

According to IBM... “Big data,” as it has been dubbed by researchers, has become so valuable that the World Economic Forum, in a report published last year, deemed it a new class of economic asset, like oil.³²

As we have seen, the desire to create automatons is a familiar theme in human history, and during the age of the Enlightenment mechanical automatons really became not only an “emblem of the cosmos”, but a symbol of man's confidence that he would unlock nature's greatest mysteries and fully harness her power. Even as automatons also came to represent repression and servitude, man's confidence remained undeterred. In more recent years we can see the rapid advancement of man's MSTM (again: modern scientific and technological mindset), rising in conjunction with the invention of “information technology” in general³³ and “Big data” in particular.

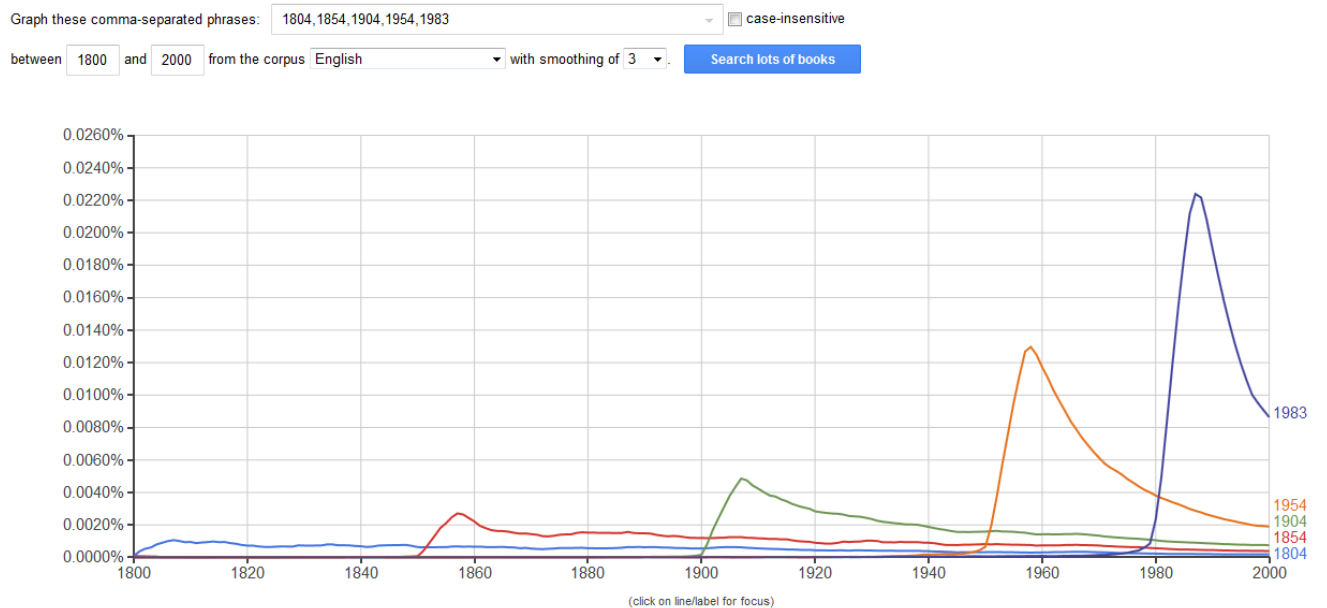


Jean-Baptiste Michel and Eric Lieberman Aiden present.

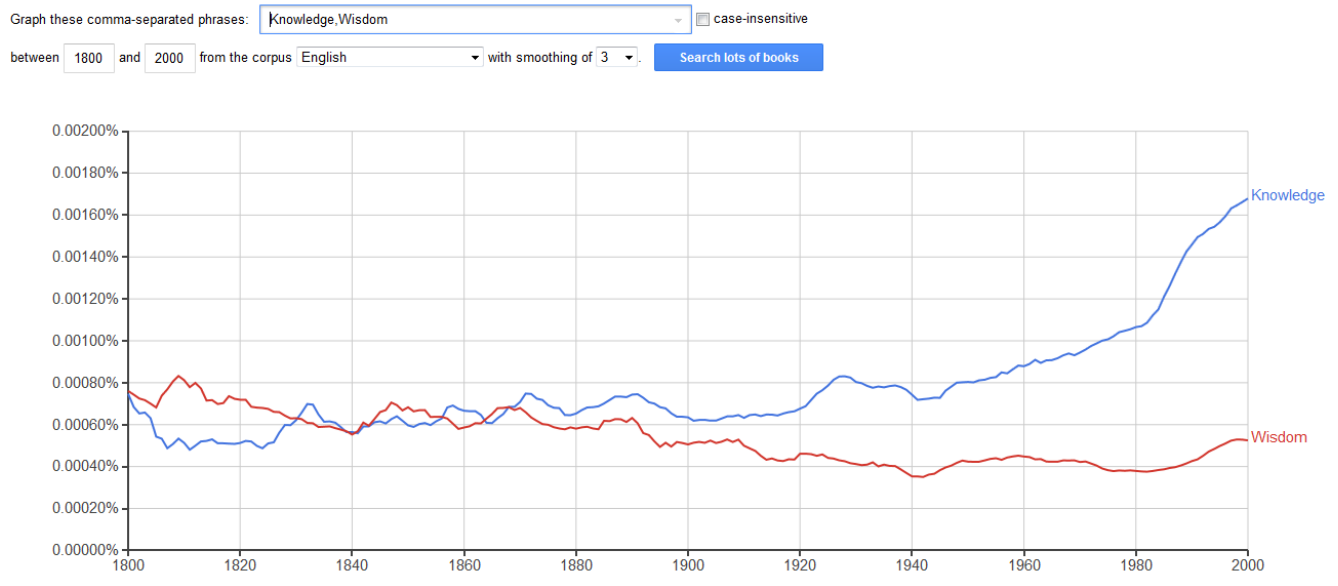
In their recent book, *Uncharted: Big Data as a Lens on Human Culture*, scientist-humanist hybrids Erez Aiden and Jean-Baptiste Michel begin by asking a provocative question: what if there was a robot that could be programmed to read all of the world's books and then tell you what it had read? They then let you in on the surprise – there really is such a robot, and it is none other than Google's n-gram viewer, which allows users to query – in the millions of books that Google has scanned – word and

phrase frequency over a period of the last 200 years. For example, it appears that you can find out, for instance, that while mentioning dates is becoming more frequent, we are also forgetting history faster than we did in the past. And not only this, but while knowledge is increasing, wisdom is on the wane....

Google books Ngram Viewer

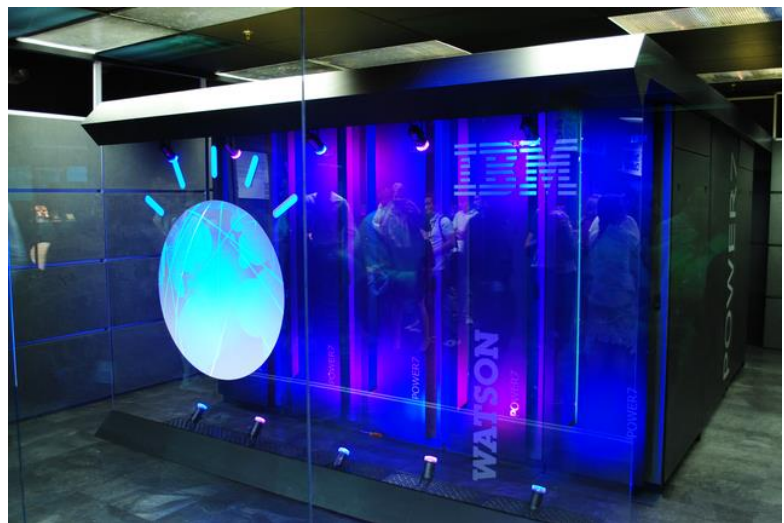


Mentioning dates more often, but forgetting history faster



Knowledge on the rise, wisdom on the wane.

In Aiden's memorable words: "You can read a small number of books very carefully. Or you can read lots of books "very, very not-carefully".³⁴ Aiden's and Michel's story might catch us a bit off guard, but it is easy to see how they can so closely relate a computer program using Big data to a robot using Big data. After all, a quick search on Google pulls up this definition of a robot: "a machine capable of carrying out a complex series of actions automatically, especially one programmable by a computer". Of course computers themselves are machines that, to some extent, carry out

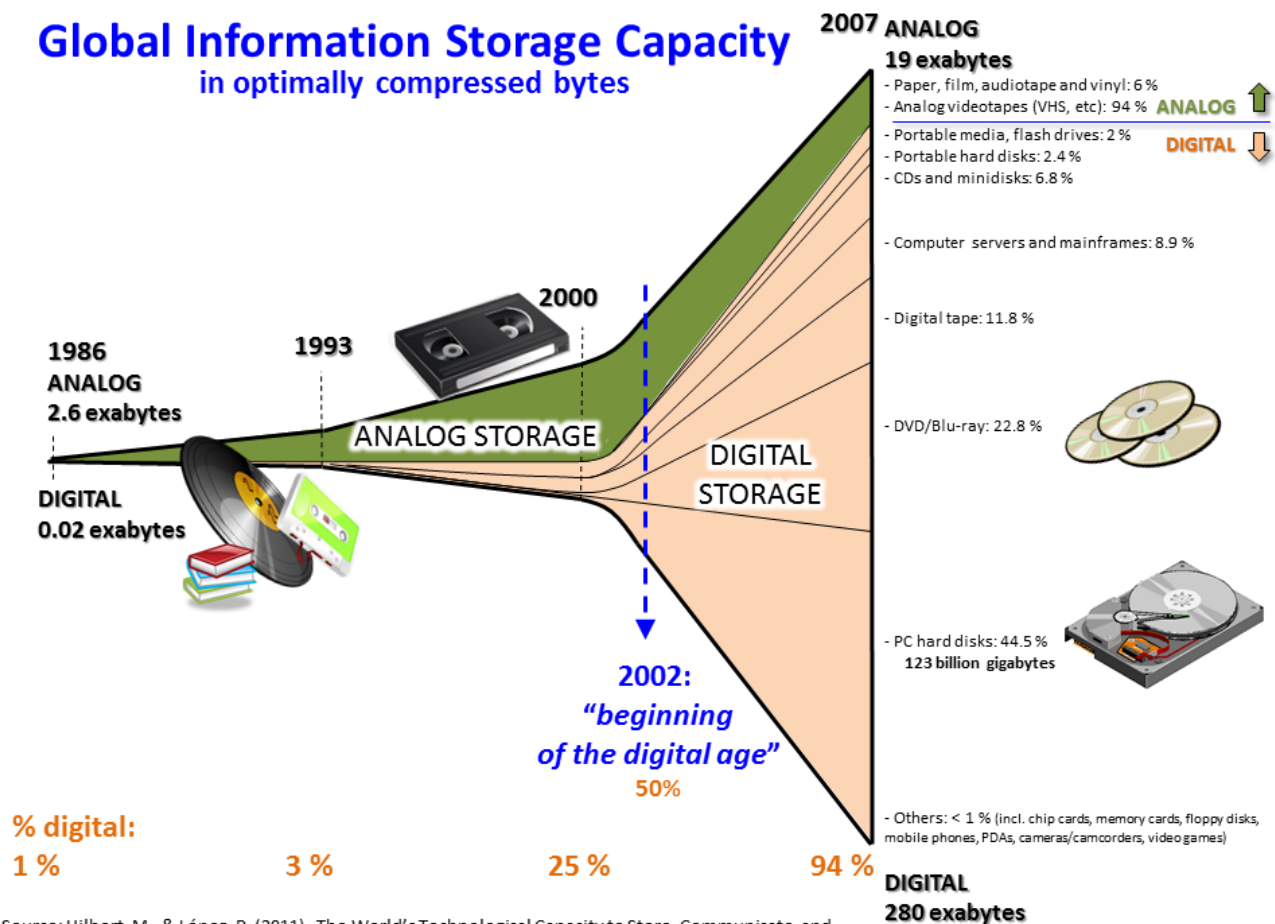


IBM's Jeopardy-winning Watson is a robot, as are all computers

complex series of actions automatically. Therefore, there is no reason that computers cannot be seen as one form of robot (and I think it is significant to point out that all robots, and all creations of man in general, are unable to assert their autonomy – as can certainly be the case for human beings, or "human being" in general, as those of us who recognize such categories would say).

In any case, from here, Aiden and Michel launch into discussions that talk not only about the massive amounts of data that the n-gram viewer uses and crunches, but the topic of Big data in general. And so, at this point, a richer treatment of Big data, the latest and greatest big thing in the "information technology" world, is called for. Some of us might be familiar with the idea of Big data from recent

stories concerning the NSA, or the mother finding out her daughter was pregnant via a big-data-driven email to her daughter's inbox from the large retail chain Target, or Google supposedly being able to predict flu outbreaks with all of the data they get from people searching. But what, more specifically, is Big data? According to Wikipedia "Big data" is "the term for a collection of data sets so large and complex that it becomes difficult to process using on-hand database management tools or traditional data processing applications."³⁵ In the last couple years we have gotten to the point where data is measured in Exabytes, and scholars from UC-Berkely have estimated that every human word ever spoken could be stored in five Exabytes. It was predicted that the internet traffic of the 2013 alone would exceed 650 Exabytes.³⁶



Source: Hilbert, M., & López, P. (2011). The World's Technological Capacity to Store, Communicate, and Compute Information. *Science*, 332(6025), 60–65. <http://www.martinhilbert.net/WorldInfoCapacity.html>

"Big data" circa 2007, when it was still small.

Those describing the rush towards Big data not only talk about this mind-boggling volume, but the "variety of information and velocity with which it becomes available".³⁷ In order to utilize these Big data – via its storage, aggregation, combination, analyzation, and extraction³⁸ – one needs "massively parallel software running on tens, hundreds, or even thousands of servers"³⁹ And why is this happening now? There are a variety of factors, including the radically reduced cost of storing data and processing data (i.e. "Moore's Law") and the corresponding event of widespread "accessibility, affordability, and

availability of new digital devices” such as mobile phones, smartphones, computers, tablets⁴⁰ and numerous other digital devices”.⁴¹ We note that in this day and age Big data and our favorite little robots always go hand in hand.

According to a world economic forum report from last year, “business boundaries are being redrawn,” and companies with the ability to mine data – in structured but also “unstructured” ways (e.g. text, audio, video, etc.) are becoming the most powerful.⁴² Of course this means that Big data translates into big changes for businesses⁴³, governments, industries, scientists and more. Unlike the hype surrounding the “semantic web” from a few years ago, *it seems that Big data, whatever the various problems surrounding its use here or there, is actually delivering a variety of concrete and practical results now*⁴⁴ – from Google’s n-gram viewer to improved machine translation to driverless cars to IBM’s Watson program beating the two best Jeopardy champions. Each of these inventions utilize Big data in one way or another. As for the “semantic web”, according to Edd Dumbill, big data will give the semantic web – which can perhaps be summed up as “self-describing web content linked together to support reliable, ad hoc discovery of information by machines” – “the massive amounts of metadata it needs to really get traction”⁴⁵

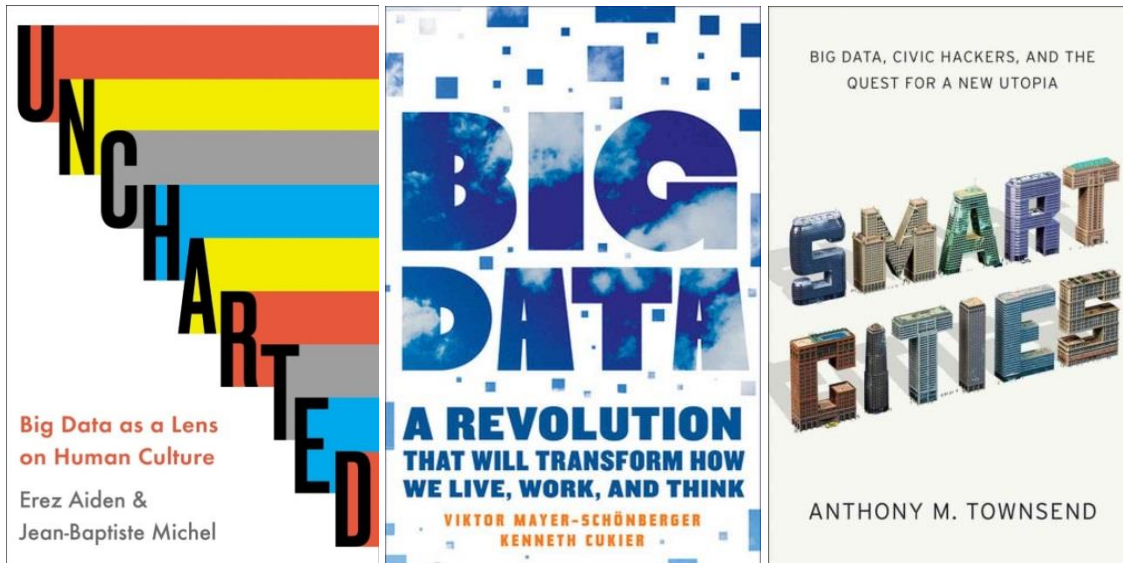


How did KIT do it without big data?!

Ever since the great Blaise Pascal built the first calculating machine in the late 17th c. – later accompanied by all manner of modern automata like those of Jaquet Droz – the march of the mathematical and mechanical has been, well, like a locomotive barreling through the world. And along with this, Francis Bacon’s emphasis on the priority of observation in time revealed how helpful carefully collected data could be to the advance of science and technology. Where Bacon talked about collecting data towards a specific scientific purpose however, today those creating

and utilizing Big data are not necessarily doing so *because they actually may not have any definitive purpose in mind*.⁴⁶ Rather, there are many who are banking on the hope that by creating massive – and ever increasing – amounts of “messy” data the ever-growing ranks of “computational thinkers”⁴⁷ will be able to analyze it, note correlations (not so much causation, even as the existence of causation is still a fundamental assumption), and utilize it in a variety of creative ways.⁴⁸

So, what is not to like about what automata, computers and now Big data can bring us? Is it not exciting that the world is rushing into this uncharted territory? Why not invite the fact that more and more “language” is being written for machine communication than human communication? For what reasons would we not invite “a revolution that will transform how we live, work, and think?” If we are in love with our smart phones and devices, why would we not want to create increasingly smart cities, for example? Is it not reasonable to think that Big data and “civic hackers” can give us hope that “the quest for a new utopia” is not in vain?



As computer scientist and entrepreneur Martin Ford claims: *“we can expect that the rate of change and the volatility of nearly everything around us will be somehow amplified by the incredible increase in our ability to compute”* (pp. 46,47). But is this a bad thing at all? For example, while it is true that the free enterprise system is often volatile, is it not true that overall, the benefits outweigh the costs – and that technology will ultimately only enhance our prospects – not only here but abroad?

For many the volume, variety and velocity that Big Data offers, like the free enterprise system itself, offer real hope, for it is not uncommon for us to put our hope in technology. This is the MSTM at work, and, at the very least, I suggest that there really is some profound ethical and philosophical reflection that needs to occur there – for librarians and beyond. Before we talk about this however, it should be helpful to discuss the nature of technology and the inevitable effect that it has on its creators.

III. What is technology?

*No no limits, we'll reach for the sky!
 No valley to deep, no maintain to high
 No no limits, won't give up the fight
 We do what we want and we do it with pride
 --2 Unlimited⁴⁹*

So at this point, let us now ask: what is technology? Well, Microsoft, for one, had an answer to this question during this year's Super Bowl:

“What is technology? What can it do? How far can we go? Technology has the power to unite us. It inspires us. Technology has taken us places we've only dreamed. It gives hope to the hopeless. It has given voice to the voiceless.”

That is the MSTM's definition of technology. But I told you guys that I wasn't going to focus on religion⁵⁰, so perhaps we should move to Dictionary.com, where we read that technology is...

the branch of knowledge that deals with the creation and use of technical means and their interrelation with life, society, and the environment, drawing upon such subjects as industrial arts, engineering, applied science, and pure science.

While this definition seems good as far as it goes, I think it misses something important and so I'm going to make up my own definition, or at least repeat what I have heard from others and made my own: *"technology is anything a human being creates that can be used to enhance one's powers beyond the ordinary – including extending one's reach beyond a particular time and location."*⁵¹ With this definition, we can say that not only books but writing in characters itself is a technology⁵². To illustrate: a classical poet putting forth verse in order to magnify something's inherent and intrinsic goodness and value would be art, but "capturing" such words in the form of letters with ink, pen, and paper would also involve utilizing technology. Also libraries, with the many organized functionalities and processes they use to serve patrons, can also be seen as a technology. I work at Concordia University St. Paul in the *Library Technology Center*.

One of the reasons I think defining technology this way is important is because I think we should be putting the emphasis on the human beings who make technology and the reasons why they do so – this is not a typical focus of MSTM. In short, even saying something like "information technology" can give us a skewed picture of the complexities that are involved here, often causing us to downplay the human aspect. And ideally, any technology should not ultimately be dehumanizing, but should help bring out in us, nurture in us, what is most truly human – and should be used to serve our fellow human beings. This is especially important to emphasize because while technology can certainly be used for both good and evil, it is inevitable that while technology is created by human beings, it also helps form them.

In Anthony Townsend's book *Smart Cities*, he illustrates this by talking about cities as technologies:

"the purpose of cities has always been to facilitate human gatherings... cities are actually social search engines that help like-minded people find each other and do stuff... The big buildings we associate with urbanity are merely the support system that facilitates all those exchanges. As Geoffrey West, a physicist who studies how cities grow, explains, 'Cities are the result of clustering of interactions of social networks.' And they are repositories of the civilization and culture that grow from these dealings. They are, as urban design theorist once put it, 'a vast mnemonic system for the retention of group history and ideals.' Cities are indeed an efficient way of organizing activity, since infrastructure can be shared. But efficiency isn't why we built cities in the first place. It's more of a convenient side effect of their ability to expediate human contact."⁵³

In short, Marshal McLuhan's well-known quip, the "medium is the message" is only the beginning of the insight that technology shapes us even as we create it. This is something that those who have the MSTM and those who do not can largely agree on – but the agreement largely stops there, as will become clearer in the next section.

IVAnd Where is "It" Going?

...when income is distributed according to a power law, most people will be below average – say goodbye, Lake Wobegon!

- Erik Brynjolfsson and Andrew McAfee⁵⁴

The “it” in the subtitle above illustrates another subtle difference between the MSTM and others who want to emphasize that technology does not “go” anywhere without us. Former *Wired* magazine editor Kevin Kelly might talk about *What Technology Wants*, but is it either true or wise to speak in such a fashion? *If it turns out that things like “information technology and Big data” draw our attention much like Droz’s automata – luring us in like any other “mechanical muse” – should we not rather want to emphasize our own autonomy and personal responsibility here to keep a clear head?*

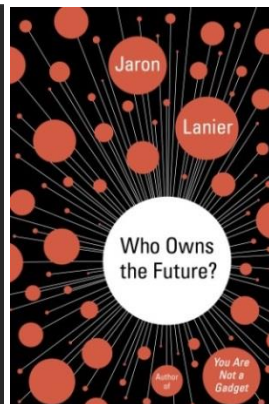
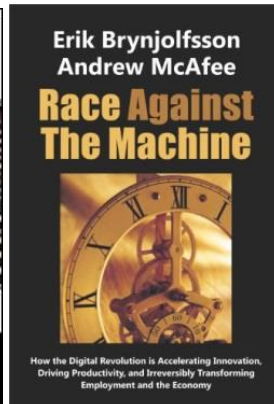
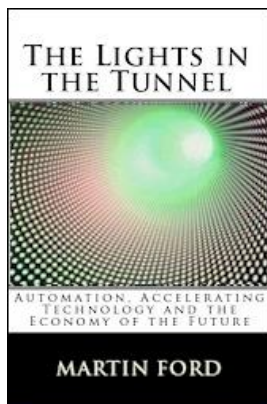
This is something that will be explored and developed more in subsequent sections. In any case, McLuhan’s idea that the “medium is the message” is certainly important to emphasize given the history of automated technology over the past 200 years. This suggests to someone like myself that one may want technological practice to be analogous to the practice of permaculture – where one utilizes nature in a deliberate fashion



Technology as permaculture

not so much to serve nature but in order to gently bend it towards the nurture and care for one’s fellow human beings. Of course, what has tended to happen in practice is that automated technologies have frequently taken jobs from human beings, even as, thankfully, new jobs have arisen to take their place, in a process that has been termed “creative destruction”.

But recent books by Martin Ford, Jaron Lanier and Erik Brynjolfsson and Andrew McAfee all make a very strong case that while technical innovation has in fact historically created new jobs, there is no guarantee that this trend will continue.⁵⁵ In fact, all of these men argue convincingly that recent technological innovation⁵⁶ is largely responsible for what has been termed the “jobless recovery”, where production and profits remain high and “real spending on capital equipment and software has soared by 26 percent”⁵⁷ even as fewer and fewer workers are hired. In other words, what is happening now is quite different than what has happened historically.



Let me briefly explain this in more detail. The claim is that this is simply because of the increasing power and role of computer power – often powered by Big data – in our world. It is made possible because “the critical building blocks of computing – microchip density, processing speed, storage capacity, energy efficiency, download speed, and so on – have been improving at exponential rates for a long time... When given to capable technologists, the exponential power of Moore’s Law eventually makes the toughest problems tractable”.⁵⁸



Heavily automated warehouses with KIVA robots that move 10,000 pieces/day -faster and more efficiently than humans could ever do...

And this means big changes in the economy. Even as some claim that automation really only has jobs that are “dirty, dull, and dangerous”⁵⁹ in its sights, the fact of the matter is that more complex factory line work continues to be automated.



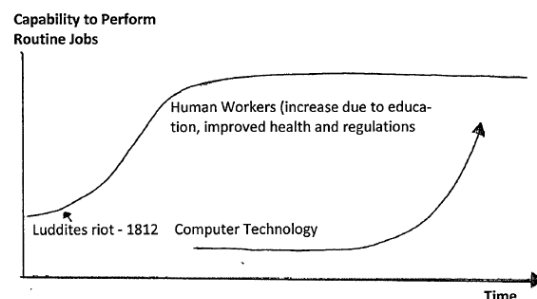
Rodney Brook’s teach-able “Baxter” Robot

“unskilled”: professions like lawyers, doctors and radiologists are said to be susceptible.⁶² Turbotax can be seen as a microcosm for the phenomenon, even as now, programs are even able to improve through use, “teaching themselves”. In addition, digitization has made it possible for “superstars”⁶³ who have a special skill, algorithm or insight to replicate this across millions of consumers in a way that can quickly drown out the competition.⁶⁴ Finally, as Jaron Lanier points out, those with the largest computer networks tend to concentrate wealth and power.⁶⁵

What this means is that while historically it has worked out that technology has made persons better off, researchers from Oxford now predict that half of

Not only this, but more and more of American’s information workers – which is 60-65% of the workforce⁶⁰ – will find themselves affected, susceptible to what economists term “technological unemployment”. In the new book *The Second Machine Age*, we are told by Brynjolfsson and McAfee that limitations of mind more so than muscle will be overcome.⁶¹ As Martin Ford says, “routine and predictable jobs are really susceptible to all kinds of automation”, and we note that “routine” does not mean

Human Capability vs. Computer Technology



Reproduction (with some enhancements) of graph from Martin Ford, *The Lights in the Tunnel*, pp. 51-53

*Ford: “...were the Luddites wrong? Or just two hundred or so years too early?” (p. 48, *The Lights in the Tunnel*, 2009)*

the jobs that currently exist in the United States will be able to be fully automated within the next few decades.⁶⁶ There are new jobs and new companies, but humans are not as necessary.⁶⁷ Martin Ford points out that this raises an important question: “when a substantial fraction of these people are no longer employed, where will market demand come from?”⁶⁸ The graph above, taken from Ford, sums up the dilemma that each of the authors mentioned above identifies.

While they offer a whole list of prescriptions, Brynjolfsson and McAfee see the problem as largely being rooted in the way we educate – we especially need to teach collaboration and creativity, in addition to advanced technical training in information systems.⁶⁹ This will encourage new entrepreneurs who will, they trust, be able to create a large amount of new jobs – even if I have a hard time believing they are really that confident of this.⁷⁰ For their part, men like Martin Ford and Jaron Lanier are far more skeptical and proffer their own solutions. But here is a key question: what if there are simply limits to how long the presence of technology – especially in the forms that it is taking today – can enable a society to build upon it and still employ human beings in meaningful work? What might it really mean, for example, that Instagram had 30 employees when it was sold to Facebook for 1 billion dollars while Kodak, at its height of influence, employed 145,300?⁷¹ It seems to me that very few persons – save perhaps Lanier – really wants to deal with the disturbing possibility that there may not ways forward that are really amenable to many of us.



Siri for the iPhone ; apparatus on the top of a Google car ; Redbox Kiosk

Why not? I submit the following: even pondering the general possibility of limits is by no means fashionable today, and one might even say it is downright un-American (even the ever-thoughtful Jaron Lanier’s own discussion of limits seems to me quite ambiguous and somewhat confusing – see pp 158-162 of his book). As a *Sprint* ad a few months ago put it (albeit in the context of the “need” to upload every photograph they take to the cloud): “I need – no, I have the right – to be unlimited”.⁷² In sum, asking serious questions about limits is not something the MSTM does. And yet, surely there must be one limit we can all recognize *today*: it is only man who is behind the curtain of any and every machine, yesterday and today. As Jaron Lanier has already pointed out in his insightful diagnosis of our current situation, while those successful companies with the most computer power (i.e. biggest servers) have certainly created much value through their innovation, there is also value that people in general contribute that makes their ideas and business innovations possible – “machine translation” being just one key example of many (this is made possible not by AI or even the semantic web, but Big data – i.e. massive amounts of human-made language translations).⁷³ There are always many persons behind the

curtain, for technology cannot exist without its creators and users (“at least so far” we are sometimes told).⁷⁴

If this is indeed the case it becomes clear that the statement by Brynjolfsson and McAfee that man should race with, not against the machine, really needs to be adjusted. *Of course* man will race with the machine: the only questions are which men this will be, *how* they will race with them, and whether or not as a result of this process they will continue to act as men should.

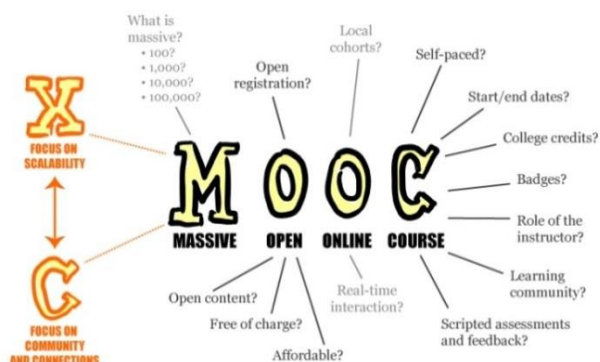
And this raises the deeper, existential question: are there limits to be respected – *are there, for example, things that are not possible as well as permanent things that will not bend from age to age?* Or is to say that simply un-American, or now, at this point in time, un-Western? In sum – *is saying this to be against all ideas of progress and the genuine help that science can bring us, as the MSTM might suggest or even insist?* Before delving deeper here to discover the intersection of these questions with ethics, it would appropriate at this point in our journey to talk about how academic libraries – and the institutions that run them – are seeking to utilize the power MOOCs, Big data, and “linked data” (the semantic web),

V. ...And Quo vadis Librarians?

Owing to their ability quickly to grasp and gain comfort with new technology trends, academic librarians are poised to emerge as leaders in a new world where data is the coin of the realm.
– Steven Bell⁷⁵

I had to change the title of this section above, because I had first written “Quo Vadis libraries”. But again, I think we must keep coming back to the fact that there are always person behind the curtain, and that it is good for our language to reflect this.

As regards libraries, new technologies, and the possibilities for the future, let’s start with MOOCs. According to Wikipedia, a MOOC, or a “Massive Open Online Course” is an online course aimed at unlimited participation and open access via the web.” Much of the excitement surrounding MOOCs comes from the fact that they allow students who are not enrolled to fully participate in the class for free – hence the “Open” aspect. That said, OOCs take lots of different forms, and there is still a lot of debate concerning what they should look like and what should be their best practices, as is in evidence from this fine graphic also available on Wikipedia.



MOOCs came on the scene with a bang a few years ago, especially getting a lot of attention when Google scientist Sebastian Thrun did a class on Artificial Intelligence in 2011 and got 160,000 students to participate. The hype seemed to reach a peak in 2012, but since that time there has been a bit of a speed bump, to put it mildly. Nevertheless, in increasingly difficult financial times, many schools see MOOCs as having the potential to keep their offerings fresh and responsive to the needs of future students. Most persons looking at the situation agree there is little doubt that what MOOCs offer will have a significant impact on the educational landscape in coming years as viable business models are hammered out. Several universities, particularly larger ones, are looking to become more involved in utilizing MOOCs (Stanford university in particular has been at the forefront of the MOOC phenomenon, having connections with several for-profit MOOC ventures) and librarians have been discussing the topic quite a bit as well.

In the OCLC webinar, “Hope and Hype of MOOCs”, a panel of scholars discussed MOOCs, their possible significance and evolution, and their role *vis a vis* academic libraires. Most of the conversation did not deal with libraries directly, but rather college and university education in general. That said, there were elements to chew on: one person suggested that Academic libraries could curate content for MOOCs ; another noted that MOOCs seemed to be opening up opportunities to do research to everyone, a “global knowledge project” that was a natural fit for librarians ; there was also some talk about libraries being able to help non-registered students with print resources that they might need or that would be helpful for their classes. The current connections that libraries have with any MOOCs seem to be few and far between although one gets the impression that many would like to be more involved with them.⁷⁶

Shifting to the issue of Big Data and academic libraries, another OCLC offering, titled *Collective Insight: Driven by Shared Data* addressed the issue of libraries and Big data. Here, participants watched videos from previous OCLC Symposia and came together online to chat, the conversation starting with the question: “What are your thoughts about the kinds of information that when shared create new potential, and how would those uses help to benefit our user communities?” In the interesting responses that followed, what became clear is that there were two kinds of Big data librarians are mainly involved in.

The first has to do with assisting researchers in data management tasks. In recent years, there has been a movement in the sciences especially to save, curate, and make accessible data from papers for other researchers who may also want to use that same data for other purposes.⁷⁷ For example, one organization says that “The Jisc-funded Research360 Project will develop technical and human infrastructure for research data management at the University of Bath, as an exemplar research-intensive university”. As such, many librarians from larger research-oriented institutions discussed what they were currently doing, the fact that many researchers did not care to share their data⁷⁸, how their “data repositories” needed to be improved, and the challenge of sharing with other institutions (for example, the necessity of using a consistent vocabulary for terms), etc.

needs for display and discovery do not represent the only use of bibliographic metadata; instead, to an increasing degree, *machine applications are their primary users. Data will be designed and developed with this in mind.* (Italics mine)

Many will no doubt yawn at this, but if this kind of language sounds at all alarming to you, perhaps you might find comfort in knowing that Alistair Croll, who spoke about the “Implications and Opportunities of Big Data” at a 2013 OCLC Symposium, thinks that the role of librarians will continue to be one of inspiration and creativity. As he notes “Google can find more articles than any librarian. Any librarian can find better articles than Google.” Where “humans are inspiration”, “machines are evolutionary”, he explains, and are excellent at optimization. They can tell you what is an optimal three wheel configuration but cannot do what a human can do, which is give you the idea of using a fourth wheel.⁸¹

Actually that might not help. If that still leaves you scratching your head a bit, you are not alone. I think I can help with some of what Croll says however, and we will do that now in our next section on “information technology” and ethical issues. And we will eventually be coming back around to discussing the issues above from a critical perspective.

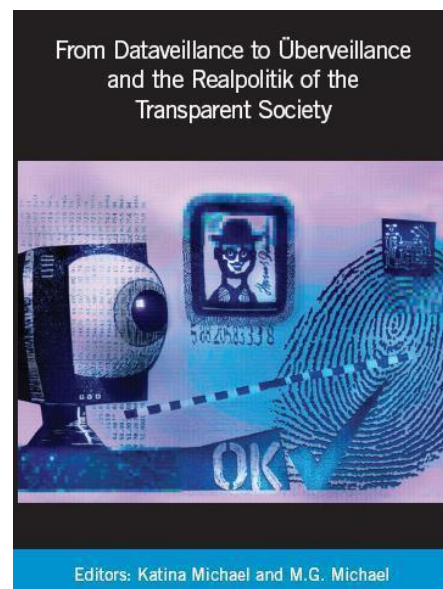
VI. Ethical Issues with Information Technology

*Big data is just people in disguise.... Even friendly, consumer-facing Siren Servers ultimately depend on spreading costs to the larger society....*⁸²
– Jaron Lanier

At this point, we will begin to address some of the ethical issues related to the use of modern “information technology” – in general, is information technology being used in accordance with technology’s rightful purposes, as described above? In passing, I note that technologies always present certain temptations to us, but that with “information technologies” – many arising from those immersed in the MSTM – the temptation is simply more powerful (much more on this in the next section). Also note that since concerns about privacy⁸³, facial recognition software⁸⁴, and all around “dataveillance” have been covered extensively elsewhere⁸⁵, I will not focus on these issues. Later on in the presentation, we will apply what is discussed here in general to libraries in particular.

Ethical issue #1 – information technology tempts us to overly simplify everything

Jumping off of Croll’s comment from the last section, it is true that the optimal three-wheeled device is indeed something that can be determined – by mathematical engineering and testing – and can thus be labeled a convergent problem. In other words, a variety of solutions are proposed and tested, until finally a design emerges which is “the answer” and remains amazingly stable over time.⁸⁶ I will take his



word for it that much reliable optimization of this kind can occur via computer without humans doing on-the-ground empirical testing.

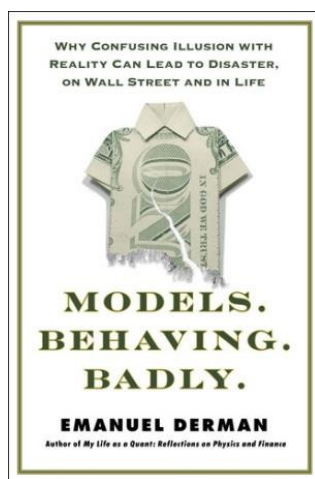
That said, life is full of not only convergent problems - where evidently the need for human creativity and activity is in the decline - but divergent ones as well, where human creativity is definitely needed. What is an example of divergent thinking? To give one easy example, one cannot ask whether more discipline or freedom in education is the best thing because it needs to be a complicated mix. E.F. Schumacher, in his enlightening little 1977 book *A Guide for the Perplexed*, looks at life in a rather broad fashion and puts it this way:

“Justice is a denial of mercy, and mercy is a denial of justice. Only a higher force can reconcile these opposites: wisdom. The problem cannot be solved, but wisdom can transcend it. Similarly, societies need stability *and* change, tradition *and* innovation, public interest *and* private interest, planning *and* laissez-faire, order *and* freedom, growth *and* decay. Everywhere society’s health depends on the simultaneous pursuit of mutually opposed activities or aims. The adoption of a final solution means a kind of death sentence for man’s humanity and spells either cruelty or dissolution, generally both... *Divergent problems offend the logical mind* (italics mine).”⁸⁷

From where I sit, it seems clear that a focus on the technological tends to crowd out the nuances here. Much of this is simply the nature of computer technology: since Turing’s invention of the computer, for example, it has become a popular idea to simply think about our minds merely as computers – albeit as “wetware” instead of hardware. And as Jaron Lanier points out about computer software, it will always necessarily constrict the world it creates – one must use what has been built into the tools.⁸⁸ I think it is clear that Big data popularizers and proponents Kenneth Cukier and Viktor Mayer-Schonberger are “constricting the world” when they ask: “The possession of knowledge.... is coming to mean an ability to predict the future... the data will take center stage... In a world where data shapes decisions more and

more, what purpose will remain for people... or for going against the facts?” and answer with “the spark of invention” – because algorithms would have said that Ford’s potential customers wanted a “faster horse”.⁸⁹ Here, I suggest that truly divergent problems are being passed over – for even with given facts that are not in dispute (sometimes a rare thing!) plenty of problems besides a lack of innovation remain. This is a simplistic approach that sees convergent problems where there is in fact no convergence. And no, I do not think that we could say that “facts *and* inventiveness” would belong in Schumacher’s list above!

Ethical issue #2 – information technology tempts us to push real costs on to everyone else

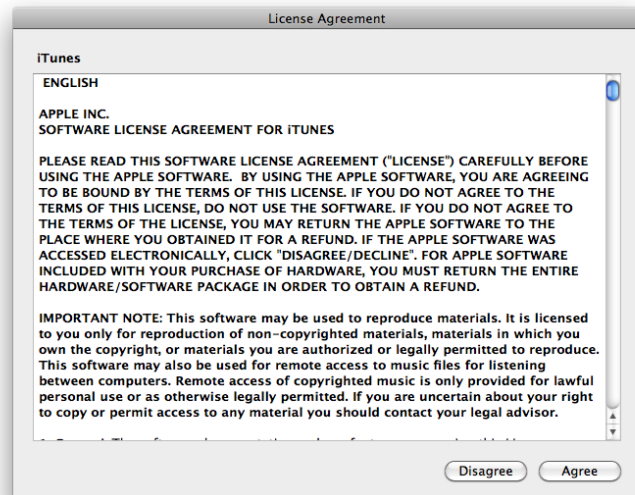


Many recent analyses resonate with Lanier’s observations

Lanier also points out another major ethical issue that he sees with modern computer technology, and this has to do with its capacity to concentrate wealth and power. Let me share some of his observations that may not

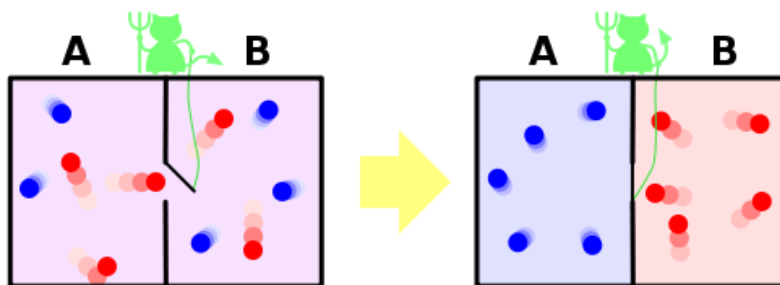
immediately seem to be relevant, but certainly are.

Based on his own personal experiences doing consultation for various institutions, Lanier notes that some health insurance companies, for example, have always wanted to only insure persons who did not need insurance. That said, with Big data and better computers, this temptation has now been made possible for those who possess them. In his words, you can now “create the perfect insurance company...” Lanier points out that some companies have bigger and better computers that run faster, are better connected, and built and maintained by the best mathematicians. Those who have the means to do so, are able to create “intense approximations of wealth and power around giant computers”. He notes that what has happened in the financial world (with disaster-causing things like bundled derivatives), the consumer communications world (Google and YouTube, Facebook), and the political world (election winners all use big computers) go hand in hand: the same story is at work.



Lanier: “[terms of agreement] basically do not exist, except for setting the basic rule everyone understands, which is that the server takes no risks, only the users of the server.”

According to Lanier, if the course of this ship is not somehow adjusted, the end results will be disastrous. And his explanation is convincing. He says that when you try to radiate all the risk to someone else society is not infinitely large and so cannot absorb all that risk. “One might think that all the risk has been loaded on to someone else but eventually you will have to pay for it”. “There is no free lunch”, Lanier asserts, drawing an analogy with what he sees happening here to Maxwell’s demon, the supposedly perpetual motion machine. “This is what happened with big finance... [this is what happened with] Enron. There is not an infinitely large society that can absorb the risks from these ‘perfect’ schemes.”



Maxwell’s demon: it does not work because energy is expended in the very act of discernment. No free lunch.

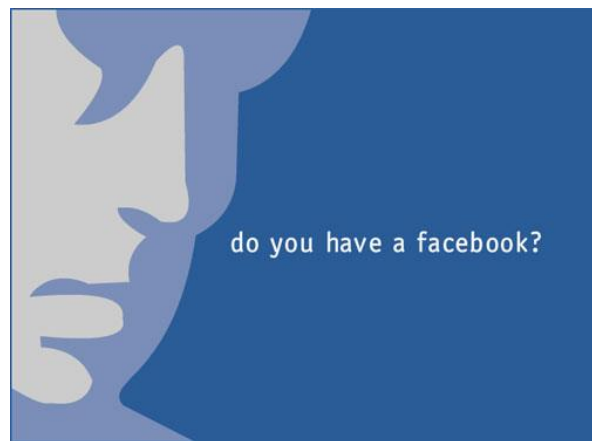


Lanier

In sum, Lanier's whole book is about how "information should be free" – at least when applied broadly beyond libraries (see Schumacher quote above)! – is a nice and understandable-sounding slogan, but eventually leaves us in the lurch.⁹⁰ He notes that because idealists like him had "insisted that information be demonetized online", "services about information, instead of the information itself would [inevitably] become the main profit centers".⁹¹ Therefore, even those who don't want to play the game have a hard time avoiding it: once everyone else is on

Facebook, it is a constant battle to explain why you don't care to be (as Croll points out⁹², in the future persons who do not participate in things like this may well be considered suspicious).

Lanier's own answer to this issue is that people who contribute information that is of value on the web should be compensated for the value they contribute online.⁹³ Noting again that the efforts of real human translators underlie all machine translation, he states "the rise of inequality isn't because of people not being needed — more precisely, it's because of an illusion that they aren't even there" and "Big data is just people in disguise".⁹⁴ Lanier also takes issue with the idea that companies like Google and Facebook are simply getting revenue from advertising. Rather, we are their product and they are selling anonymized data – which is calculated "off the books" – to companies, who then create behavioral models to subtly manipulate "what steps are put in front of you" – not communicate with us with what we have traditionally called advertising.⁹⁵ Again, I will not even get into the tangled thicket that is privacy issues related to Big data here, even as these are certainly at issue as well.⁹⁶



Play nice and be a "friend"

Ethical issue #3– information technology tempts us to be more self-centered and to increasingly "commodify" the world

Of course another issue presented by current information technologies is that their anonymity and ease of use can readily help us "enhance" our self-centeredness and self-justifying tendencies. We live in what seems to be not only an increasingly quantified but commodified world, where it is easier to treat ourselves and one another like commodities and accessories, where, as a self-help book of 15 years ago put it, we are all about "getting what you want in your relationships". Going hand in hand with this, it seems to me, is a recent book titled: *Mistakes Were Made (But Not by Me): Why We Justify Foolish Beliefs, Bad Decisions, and Hurtful Acts* by Carol Travis. I can't tell you why she thinks it happens, but I simply will say that the internet – removing us from the real awkwardness of having to physically face

other flesh and blood (yes, like the temptations posed by paper before it!) – certainly has the ability to exacerbate things.⁹⁷

Speaking of “getting what you want”, Lanier writes in the N.Y. Times that

“A Siren Server gains influence through self-effacement. There is a Zen quality to it. A big computational-finance scheme is most successful when the proprietors have no idea what they finance. The whole point is to make other people take risks, and knowledge means risk. The new idea is to have no idea whether the security you bundled is fraudulent or not.”⁹⁸

This is a concrete example of avoiding responsibility, and of “mistakes being made”, but “not by me”. He goes on to say: “The point is to be a computational actor — the more meta, the better — but without seeming, or behaving like, an actor. The digital pursuit of reward without risk happens automatically, at arm’s length. Documents are signed by ‘robosigners,’ and prices are set by ‘price bots.’”

Obviously, any idea of “doing unto others as you would have them do unto you” can be kept at a comfortable arm’s length here as well. Is it too much to say that increasingly, the subtle message is that others must earn our respect – not only to be seen as a decent human being, but to be treated like one, period? I submit that the increasing necessity for us to “prove our right to exist”⁹⁹ in each and every sphere of life is a problem that is enhanced through digital technologies – for example, a recent *Pediatrics* study talks about how digital devices negatively affect many parents around dinnertime.¹⁰⁰ Yes, online technologies may occasionally “bring out our best”, but more often than not this is not the case (more in the next section about what might be the deeper reasons for this).



Nicholas Carr

Ethical issue #4– information technology tempts us to forget how to do traditional yet valuable tasks – and tempts us to avoid attention-developing practices in general

There is one more issue I think should be addressed here and it can be summed up in the terms “memory” and “attention”. Technology and culture watcher Nicholas Carr has recently been addressing the mass “externalization of knowledge”¹⁰¹ – both the “know-that” and the “know-how”. He addresses the concern that much knowledge – perhaps some of it necessary – is being lost as we continue to rely on devices and Big data to help us do our work. For example, as an illustration, he shares the interesting example of Inuit eskimos who can no longer rely on the repository of tracking skills hitherto passed on by tradition due to the current reliance on GPS systems. What kind of responsibility does each one of us have to reflect on what human

abilities can or should not be lost? We may worry – rightly – about the crippling effects that a terrorist attack could have on the technological infrastructure that we rely on, but as Carr reminds us, there are other ways that “all can be lost”.¹⁰² Carr warns: “Seeking convenience, speed, and efficiency, we rush to off-load work to computers without reflecting on what we might be sacrificing as a result.” Of course, it goes without saying that businesses, as opposed to things like schools, are going to have a vested

interest in making things as easy as possible for their customers – even if this necessarily means that their customers will thereby miss out on learning skills that would be valuable and beneficial to them. As regards our ability to sustain attention when it comes to things like reading books, Carr also notes in his popular work, the *Shallows*, “deep and concentrated cognitive exercise changes the synapses between neurons and the structures of the neurons themselves”.

And fighting distraction en route to self-discipline is not only a practical issue, but a deep moral issue as well – and one we can’t outsource. That said, there are those who think even our conscience can be outsourced – or, to be more fair, supplemented via technical means. Ariel Garten, the inventor of a wearable and computerized biofeedback device, Muse, talks about some of the possibilities of this kind of technology: perhaps in the future, your *iTunes* device, reading your brain’s electrical signature, will say to you “I saw you were depressed....would you like this song played for you?”.¹⁰³ Even better, certain devices might be able to convince us, through their gentle nudging¹⁰⁴ that, “I *can* not yell at my kids...”. She says that we will have knowledge of ourselves via technology and be able to make better choices. As her interviewer said, “better parenting through thought-controlled computing.”¹⁰⁵

Why not? Why should I not hope for help and guidance from a technology (or, more specifically, the ones who created and programmed it) instead of myself and those others who love me? Human life is so messy after all. As I have been noting, the temptation is very real and very alluring, especially when the MSTM dominates our way of thinking. More on that in the next section.

VII. “Why Don’t You Marry It?": Seduced by the Mechanical Muse

“When our machines overtook us, too complex and efficient for us to control, they did so fast and so smoothly and so usefully, only a fool or prophet would have dared complain.”

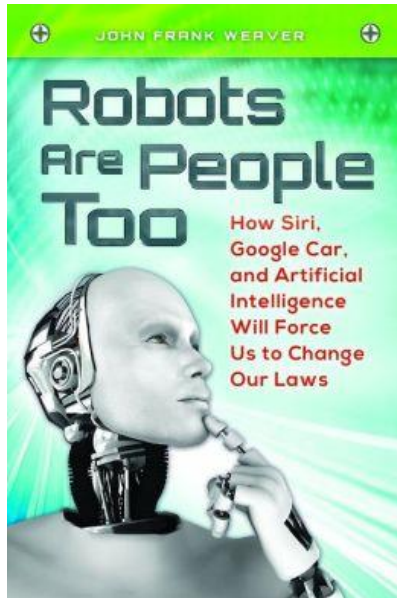
-- science fiction writer Simon Ings¹⁰⁶

In the same talk mentioned above Alister Croll stated that “24 months ago, the average person was still afraid of IT. Today, the average person is terrified of being without it.”¹⁰⁷ Exaggeration or not, Croll hits on a critical point here: we are increasingly becoming more comfortable with digital technologies, particularly the youngest among us. This is the case to some extent in most all of us, whether or not we strongly identify with the MSTM.



Sherry Turkle

MIT professor Sherry Turkle has done research in the area of “companion robots”, interviewing hundreds of people for her book *Alone Together: Why We Expect More from Technology and Less from Each Other*. She finds that, out of a sense of disappointment with each other, several persons have turned to robots as a substitute for human interaction. What Turkle meticulously charts in *Alone Together* are robots used by lonely, isolated human beings as lovers, best friends and caregivers.



According to her, in the world of sociable robotics, nurturance is the killer app - we nurture what we love, but we also love what we nurture. After studying every “digital creature” that asked for our care, Turkle concluded that we attach to things and want to love them. The “robotic moment” that she talks about is when we begin to *think* robots care about us and consider them as candidates which can be put in the place of human beings. There is a gradual slide from “better than nothing” to “better than anything” – while a robotic puppy might not seem so good at first, the robotic puppy will never die.

Hence, we are very vulnerable to what technology affords. Turkle’s evaluation: “We are toast”.¹⁰⁸

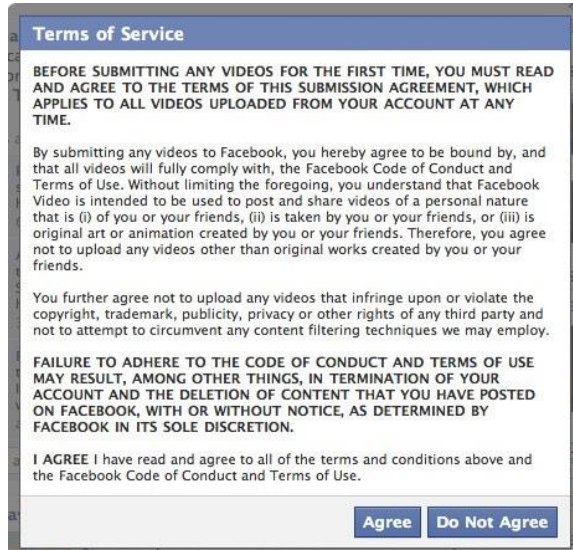
Can one identify a similar phenomenon occurring with regular web applications? It might seem a real stretch to say so – the *Star Trek*

Next Generation “Holodeck” would seem to be a few years from production – but consider this: *as computer environments become more immersive – fueled by all the shaping power that Big data will be able to provide – the temptation to regularly inhabit them will likely become much greater.* And we will no doubt find ourselves desiring – at this or that level – what they offer. In a recent edition of the KCRW (an NPR affiliate) news program “This is Interesting” Matt Miller described his experience of having his brains electrical signature extended out into a beautiful picture he could manipulate: “cool, surreal, otherworldly”.¹⁰⁹ And surely, more is to come.

Of course, even now, we are being courted and wooed. The internet – rather, those running the web applications on the internet – offer us all manner of things without much commitment on our part (just the way we like it these days!) – giving us promise that it can, in part, fulfill our dreams and desires: pleasure, intimacy, and a sense of vital connection.¹¹⁰ And it can give us other things, that while lesser wants, are still very highly sought after by us. Jaron Lanier talks about the “candy” being offered: “insanely easy and cheap mortgages; free music, video, Web search and social networking: all are examples of the trinkets dangled to lure initiates into answering the call of a Siren Server.”¹¹¹



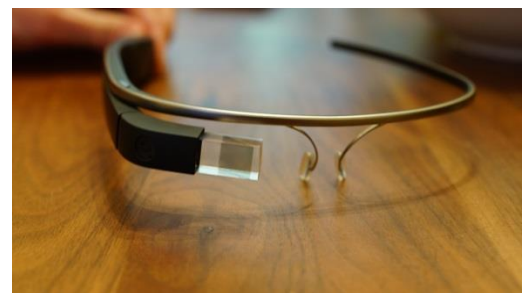
Heard of her?



Of course you read this... Amazing what we put up with for those we love.

Again, services like Google become more powerful by giving us what we want – by leading us to things Google did not create – so that, ultimately, we might more and more become their product – as they sell our interests, our attention, and increasingly, our data (anonymized of course) to others.¹¹² And, besides the occasional uneasy feeling about the whole thing, we generally love it! And the one courting us is a powerful and attractive partner indeed! As Lanier explains, “Google ad is guaranteed to work, the overall Google ad scheme by definition must work, because of the laws of statistics. Superior computation lets a Siren Server enjoy the magical benefits of reliably manipulating others even though no hand is forced.”¹¹³

And this game being played is even more sophisticated still. Lanier also talks about how Steve Jobs learned from Eastern gurus that sometimes, it can be very effective to more or less give someone what amounts to a public beating. For example, by berating an employee in front of other employees, Jobs would not necessarily cause someone to quit, but instead to become more loyal to him – and to work even harder for his approval. In like fashion, companies like Google will try to increase your addiction – your “attraction” – by using something called a “noisy reward”. A noisy



Will Google look even hotter yet when you are wearing Google goggles?



Japanese companion robot for the elderly.

reward is a reward that is not always doled out in a consistent fashion. Because this is the case, it has the paradoxical effect of generating repetitive behavior on the part of the user. The idea is that you “fall in love” with what you have to struggle for, and social networks only tend to exacerbate this effect.¹¹⁴

Seduction per se does not need to be evil. One can certainly argue that there is a proper context to woo and to win. That said, this is decidedly not the case with the player who seeks only to get into our pants, our pocketbook, or our playbook (i.e. all of our personal data). Modern internet companies seem more akin to the player than the genuine lover. One is reminded of a quote from Bunyan’s *Pilgrim’s Progress*, quoted by C.S. Lewis in his book *The Abolition of Man*. Lured in by earthly pleasures, Pilgrim realizes what has become of him: “It came burning hot into my mind, whatever he said and however he flattered, when he got me to his house, he

would sell me for a slave.”¹¹⁵

Here, one cannot help but think of the many companion robots being enlisted to help the elderly in Japan – many of the persons stuck in these situations are genuinely sad that this is their plight. Does it occur to us, as Turkle says, that we would have people to do these jobs if we respected this type of work – if we respected our elders who need this kind of work – enough to pay them a decent wage? But we do not – first they are consigned to nursing homes and then they are banished to live with robots performing the cheapest labor possible.¹¹⁶

It is true that family life – and especially village life! – was never perfect and is easily romanticized, but at least here persons beyond our immediate family knew us, loved us, and depended on us. Maybe there were even small business owners who we never could doubt for a minute really did care about us on a personal level.¹¹⁷ And for many of us, when our parents gave us a toy, there was of course a genuine love behind his actions, and not motives like those of which we have been speaking.

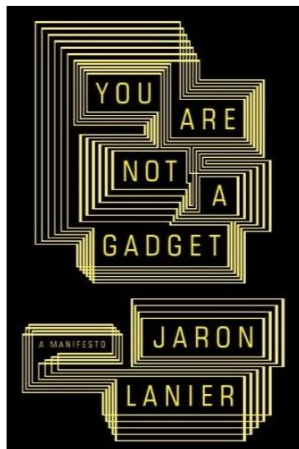


Ariel Garten and her “Muse” – ready to get “carried away”?

Why do I bring up toys? I note that automated functions began in toys – a la “candy” – before moving into industrial machinery. This looks to be taken to a whole new level as automation moves into the realm of “cognitive machinery”. *At this stage in the game, who are our electronic devices and online accounts really there for?* While I must admit it seems a bit extreme for me to say it, here I go: *“Become one Big data...become one with it.... Welcome to the machine....”*

Are we slowly becoming that which we want to be and that which we don’t want to be? Are we all increasingly awash with facts, figures, data....and readily contributing to the same, but with no real grasp of who we are? I think this is clearly the case, and will argue just that in the next section.

VIII. I think Therefore You Aren’t?: Philosophical issues



“The machine does not isolate man from the great problems of nature but plunges him more deeply into them”.

— Antoine de Saint-Exupéry¹¹⁸

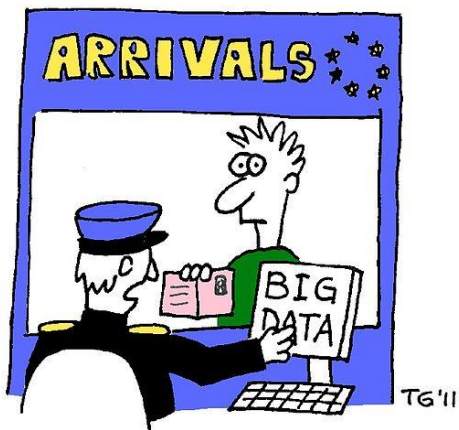
I suggest we are slowly becoming one with the Mechanical Muse – surprisingly alluring – that like a physical automaton can serve as a symbol – a microcosm – of what the MSTM sees (at the very least as in practice)¹¹⁹ – as the cosmic machine, our “final frontier”. But we may question: is this really a bad thing? For example, Sherry Turkle may be warning us about the ways that machines can seduce us, but in a panel at a recent QUT Robotronica Event Dr Christy Dena spoke excitedly about such a phenomenon, stating:

"All you have to do is put two eyes on a robot and people will treat it in a certain way".¹²⁰

What is she really getting at here? Let me suggest this: when it comes to determining what is alive, what is a "person", or what is at the very least equivalent to human being, all that is felt and *thought* to matter is what we notice with our senses. As one of the other distinguished panelists¹²¹ at this conference suggested, *we as human beings will discern a robot to be an intelligent and self-aware entity when we say "I would have done that"* ("What else do we have?", even the sophisticated person today asks)¹²²

Assuming this is true, what are the practical implications of this? I see two fundamental and related issues here: first, robots and how they "know" us. Second, and following from the first, how human beings are increasingly coming to "know" other human beings through technology.

How do robots really "know" us? Up to this point, I think it is easy to see how. Recently, in an interview with the New York Public library Jaron Lanier, when asked to share seven words that might define him, answered in a joking but semi-serious way, "our times demand rejection of seven word bios."¹²³ Doing that, Lanier explained, is a form of disempowerment because "you are creating database entries for yourself [i.e. "putting yourself in standardized forms"] that will put you into somebody's mechanized categorization system."¹²⁴ As stated in Don DeLillo's award-winning 1985 fictional novel "White Noise": "...you are the sum total of your data. No man escapes that."¹²⁵



"Your recent Amazon purchases, Tweet score and location history makes you 23.5% welcome here."

Never before has the phrase "nothing personal – just business" been truer.

This is how robots "know" us. The "useful fiction" for the robot – or, more accurately, for the one programming the robot – is that through a combination of some information about yourself – culled from structured and unstructured data sources – and some workable mathematical models and algorithms, you can be understood insofar as necessary – for the goals they think best (and how can you doubt that they care?¹²⁶). Yes of course, maybe the maker can't *really* understand you on a deep level, but the maker, through the robot, can see evidence of what you do – perhaps even noticing things about your behavior that neither you nor

anyone else has.¹²⁷ And that is all he needs: taking account of this "works" for him regarding the things he wants to do: sell things to you, prevent terrorism, perhaps even genuinely help you, etc.

I simply note what happens to the maker – and the users – as this kind of technology is embraced more and more – we choose to understand others through the limitations of the robot. Anyone who knows something about the origin of computers should not find it surprising that some who use powerful computers are tempted to reduce what is complex into a false simplicity. Alan Turing invented the computer based on his own idea – his own model – of how the brain operated and how human beings communicated. After the computer begin to dominate our lives, it became more and more common to

think about the brain – and our own communication as human beings – in terms of the computer itself and computer networks. As far as it pertains to academia, this happened in the sciences as well as the humanities. Jaron Lanier even talks about how words like “consciousness” and “sharing” have been “colonized” by Silicon Valley nerd culture.¹²⁸

Is this a cause for concern? Is this perhaps a major frog in the kettle situation? Can we say that as we increasingly give ourselves to the technology, we see that it is not so much that the robots resemble us, but we that resemble the robots?¹²⁹ *Why am I wrong to suggest that technology – perhaps particularly computer technology – offers us powers that appear to enable us – like never before – to not have to really know and love persons and things – or at least to not know them very well?*¹³⁰ Rather, with other human beings, we are ever more tempted to operate by force – applied more lightly or heavily as the case may be, aiming to attain what we want now in a “good enough” fashion – and supposedly with few or no consequences.¹³¹



To many, this evidently does not seem to be something to be overly concerned about. After all, perhaps it is only fair – at the very least it makes sense that robots *might* be people to (another “useful fiction” for now?)! And even though you don’t necessarily understand them, you do, after all, use their services which “work” for you.¹³² Do unto others as they do unto you, you know.

But if “good enough” increasingly becomes the *one ring to rule them all*, how will our human relationships be affected – and will we be able to keep going on like this? Perhaps that is the question for us. As technology becomes more and more ubiquitous, we see more and more “smart technology” leading up to more and more things automatic and robotic. What does this mean for each one of us? “Thank you for becoming a part of the machine?” The evisceration of our souls?

Is it not clear that those who give themselves over to the lure of these kinds of “power tools” – *seeking the powers afforded by the technology apart from technology’s rightful purposes – in fact yield to the same pragmatism and reductionism those wielding them are captive to?* In other words, are they not ultimately nullifying themselves philosophically, politically, and economically – their value increasingly being only the data concerning their persons... and its perceived usefulness?

The MSTM seems to increasingly be the water in which we swim – are we concerned?

Lanier’s wager and privatized humanism

Jaron Lanier is concerned and here is where his ideas again come into play. I see his book *You are Not a Gadget*, for example, as very much going against the flow – even the flow of what is generally thought to be knowledge.¹³³ *In a recent interview with KCRW’s Matt Miller, Lanier stated that “we are better off*

*believing we are special and not just machines”.*¹³⁴ *I see this point as critical in addressing another point he has made: “Clout must underlie rights, if rights are to persist”.*¹³⁵

And I will call this “Lanier’s wager”, drawing the analogy from Pascal’s more famous one. For me, hearing such words from Lanier resonate with my soul, but are, in the end, only slightly encouraging to me. It seems to me that he is fighting a losing battle with weak weapons.¹³⁶ For these are not the days where most persons know of any real grounding for “the inalienable rights of man” or even the days of Ralph Waldo Emerson and Henry David Thoreau when transcendentalism held some sway in the land. After all, even Lanier says, “we are the only measure that we have of the world”.¹³⁷ These are the days where it is at least somewhat reasonable to talk about rights for animals¹³⁸ (is Lanier a “speciest”¹³⁹?), plants, and yes, even robots.¹⁴⁰ These are the days when there are movements headed by serious intellectuals among the elite of the elites that go by the name of “posthumanism” and “transhumanism”¹⁴¹.



Harry Bates’ “Pandora”

For in the end, it comes down to this: Jaron Lanier’s humanism, as better as it might be compared to the views of many, is only a “privatized humanism”.

I submit that the fight cannot be won with a “privatized humanism” but can only be won when hearts and the habits of the heart are fundamentally changed.¹⁴² Certainly, there are many who still believe that there is something more foundational about life’s essence than the simplest particles of physics and nature’s laws.¹⁴³ That said, even here, the temptation is great even for those who try to hold onto traditional views. For example, in his review of the new book *The Second Machine Age*, David Brooks says “essentialists will probably be rewarded” in the machine-dominated economy. But whatever Brooks might mean by “essence”, it does not seem to be connected with any classical notion of permanence – i.e. something that is intrinsic, real, and lasting: “creativity can be described as the ability to grasp the essence of one thing, and then the essence of some very different thing, and smash them together to create some entirely new thing.”¹⁴⁴ Sounds rather violent and un-conservative to me!¹⁴⁵

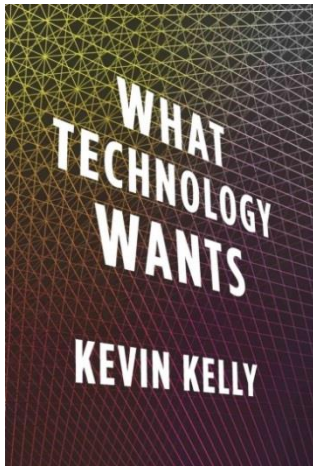
The firm conviction that there really are essences in the world that ought not or cannot be changed – i.e. that there are some boundary lines that should and in some cases cannot be crossed (at the very least in the long run) – may certainly be seen as confining and suffocating.¹⁴⁶ But on the other hand, it can be comforting as well to know that there really are some *things* we all have in common – and that we can count on.¹⁴⁷

Along these same lines, reading about the all-important topic of education, I recently came across these wise words from one Robin Lewis: “Appreciating some artifacts are good in themselves, and not merely because of what they *do* for us, is the first step towards a proper appropriation of the liberal arts”¹⁴⁸

Indeed. And if that goes for things in general, it really does double in importance for other human beings in particular. *Big data*¹⁴⁹ and information technology must bow to higher principles – held by human beings who sincerely believe in them. “Good enough” is not good enough for the library’s soul.

So let’s talk now about libraries, technology and the classical liberal arts.

IX. What *should* libraries do? (reflections and recommendations for discussion)



Photography, from its inception, has been dogged by a somewhat peculiar superstition: that by recording your image, a camera steals a part of your soul. There is something to that idea.... Having just a single picture of someone can give you a form of power over that person. Will Big data steal your soul outright?

– Jean-Baptiste Michel and Eric Lieberman Aiden¹⁵⁰

Most librarians are familiar with [Raganathan’s five laws](#), one of which states that “the librarian is a growing organism”. If one keeps up in books about technology and its effects of human culture, it’s possible that such a view can be seen to go hand in hand with the views of Kevin Kelly, who again, has written a book called *What Technology Wants*. As the plant in the windowsill leans towards the sunlight, so technology has its drives or desires

as well. Technology – or the “technium”, as he calls it – is a living being.¹⁵¹

Is this the way for libraries to go? Or is to say that the final evisceration of our “god in the machine”.... the evisceration of the library’s soul....? I suggest we all actively think about the *should* now, exercising every rational power we human beings possess in order to keep libraries on a good path now and in the future. The MSTM must not overtake us.



In a recent blog post titled “Academe quits me”, the author, a university English professor whose contract had not been renewed, stated: “Humanities course enrollments are down to [seven percent](#) of full-time student hours, but humanities professors make up [forty-five percent](#) of the faculty. The imbalance cannot last... ” This man, D.G Myers, goes on to say: “where there is no common body of knowledge, no common disciplinary conceptions, there is nothing that is indispensable. Any claim to expertise is arbitrary and subject to dismissal...”

This relates very much so to the quote I used in the last section of this paper from Robin Lewis, which stated that “some artifacts are good in themselves, and not merely because of what they *do* for us”. Myers is really objecting to the loss of the idea that there is any tradition worth studying and passing on, and this, it seems to me, is one of the key components of such a tradition. *I want to discuss answers to the questions posed by MOOCs, Big data, and the semantic web, but I*



Or is the truth that things are, generally speaking, simply getting worse? See [here](#).

think that that conversation should happen in light of this larger context that I am trying to put forth in this paper: what are the challenges and temptations that human beings are susceptible to that technology – particularly MSTM-driven “information technology” exacerbates? That have the potential to help us fast-track the re-making a world that is, in the end, less and less human and humane, as opposed to more?

There is so much more that I think needs to be said here¹⁵², but I will try and stay focused (hah!). Please note I am going to be rather uninhibited in my speech here. I realize that I know those in leadership positions would need to approach all of these issues in delicate and personal fashion, in addition to the firmness and patience I submit is necessary.

MOOCs

Insofar as librarians might have a voice regarding their institution’s approach towards MOOCs, let’s look at what Jane Robbins, writing for Inside Higher Ed’s education blog, has to say:

Let’s take for illustration EdX, the joint venture between MIT and Harvard.... EdX does not employ professors as professors; they are not an institution of higher education, or school. Not sure anyone has noticed this small fact about MOOCs.... EdX, like Facebook, could make its money by selling its analytics to others (and, like Facebook, become under constant pressure to redesign services in the interests of those customers, not the “users”).... MOOCs are of greatest value as a form of Big data, and their inputs are people they come with all the [privacy issues](#) that entails...

Well, all of that is very interesting (yes, I have selectively quoted her – she is much more hopeful than I am, and likes the idea of MOOCs as a business, save the data mining). But I note with particular interests these words:

[MOOCs] retain their indifference to admission criteria (for now, although there is some movement toward elite MOOCs) and to retention, which means they don’t really care about *whether* students complete or not—but they do care about *who* completes, and *why* (or why not), and perhaps *what* can (or cannot) be successfully taught this way.¹⁵³

And for now, that's all I need to know. *Generally speaking*, MOOCs – or those running them – don't really care about admitting or retaining particular students – that would require more personal attention that MOOCs can promise.¹⁵⁴

With the current focus of MOOCs, it seems to me that the quantitative concerns tend to rather shamelessly swallow up the qualitative ones. This is not to say that Higher Education in the past always did care about student, but in the past people in the “business” of education at least knew that they should care, and be ashamed if they did not. That, it seems to me, is a difference.¹⁵⁵ Not to say that MOOCs could not, in some fashion, be more ethical.¹⁵⁶ The same, I think, goes for most any technology, including “Big data”.¹⁵⁷

Regarding Big Data

According to Viktor Mayer-Schonberger and Kenneth Cukier, “Big data changes the nature of business, markets, and society”.¹⁵⁸ Well, if we used Big data to the extent that many businesses would like to use Big data, it certainly would change the nature of libraries. Let me briefly ask the few following questions of any who might find themselves in these situations with clout: *As large libraries take on the issue of data management more and more will they – will you – insist that this is not the core aspect of the library's mission, but only a supplementary aspect – and that any attention given to this task needs to be supported by additional monies in library budgets?*¹⁵⁹ And as library administrators are asked to assess more and more here *I think we need to walk a fine line between the wisdom in assessment*¹⁶⁰ *and the futility of assessment.* Kevin Smith gets us started off on the right foot by insisting on a definition of efficiency: “An activity is efficient if it produces the maximum amount of value for the least investment. So the real question is, what do we value?”¹⁶¹ Of course, how this should be evaluated (not, more quantitatively, “measured”) is key as well. Hopefully, your library's relationship with your community and its administration is such that you will never find yourself in the absurd position of having to defend your library's existence.

It seems to me that findings of the French researcher Joelle Le Marec , who did a study on museums and those who attend them, should be heeded here:

“museum administrators think of their institutions as players in a market and library/museum visitors as consumers... Yet none of the users Le Marec's team interviewed thought of themselves as consumers. *They did not come to buy; they came to learn....* The purpose of the institution is sought through the survey questions when *in fact it is the existence of the institution and the purposes for which it was established that creates the practices associated with library use. Studies of library and museum use almost always forget that.*”¹⁶²

Regarding Linked Data and the Semantic Web

To the Library of Congress' working groups words that machines would be the “primary users” of library data, University of Chicago librarian David Bade, writing in *Cataloging and Classification Quarterly*, had some harsh words:

“To claim that machines are users is simply to ignore the fact that people are using those machines to do something: the machines follow instructions according to their human users’ purposes, and those humans are living and acting in the real world, not the world of any user model or Semantic Web—unless, of course, we are designing for the Semantic Web’s perfect user, the spammer.”¹⁶³

Let me make it clear that I am not saying that we should not have anything to do with the semantic web. That said, I think Bade’s words do merit our attention, and it seems to me that many in the library technology development world are betting a lot on the idea of linked data and its future capabilities – for example, there is a drive to transform everything that is currently a “text string” into an “identifier”, as the computer scientists say. It seems to me that in the process, today’s imperfect but proven library services (at least to those who use them most) – which possess a reasonable amount of efficiency for many tasks – are downplayed, seemingly being suffocated slowly for lack of attention, not only by OCLC but some library vendors as well.¹⁶⁴

Recently, the CLIC consortium of which my library is a part adopted ProQuest’s *Summon* and its new *Intota* product. The first versions of *Summon* and *Intota* did much to really downplay the significance and functionality of Library of Congress Subject Headings, and, in my evaluation, really took away what we have traditionally considered essential library functionality. While I appreciate what keywords and algorithms can do, I also appreciate the predictable and classical tools that maybe even Hobbits – who would not use a tool unless they could figure out how it worked¹⁶⁵ – would use.¹⁶⁶ Thankfully, we raised our voice and ProQuest has written it into our contract that they will be fixing some of these issues.¹⁶⁷ For now.



Recommendation to not discriminate: relatively Hobbit-friendly OPAC functionality should be continued

Liberal arts and libraries

Regarding the increasing role of technology in the liberal arts itself (i.e. the “digital humanities”, starring men like Aiden and Jean-Baptiste), some persons have asked excellent questions. For example, “With financial stress and waning student interest, will the “lure of money and technology.... Increasingly push computation front and center”?¹⁶⁸ and “will [things like the digital humanities] come at the expense of traditional approaches” and “sweep the deck of all money for humanities everywhere else”?¹⁶⁹ And of course, for some, like myself, there are deeper concerns that underlie these concerns.

Are people subject to the limits of nature or does “information technology”, as the MSTM would suggest, make us unlimited in our prospects – and, frankly, our ability to reduce persons to machines and their data? (see last section) Years ago, people at least thought they could say that individuals had rights that were endowed by a Creator because persons really did believe this was true – even if many

persons held those beliefs inconsistently. Where is this still true? Who believes that colleges and universities have a responsibility to uphold and inculcate what we can loosely call the “Western tradition”?¹⁷⁰ This does not mean worshipping dead white males. This means dealing with issues those in the past considered to be timeless – as opposed to the trendy, the fashionable, the miscellaneous short-lived faculty enthusiasms.¹⁷¹ And if so, what is the role of libraries in particular in this effort?

Or was Goethe right? Will classical languages, classical literature, classical arts – will meaning, ethics, and notions of cultural maturation (“*bildung*”) – be replaced by science and technology, where every tool would be used to maximize the power of human being – some human beings that is? Emerson wrote of railroads and steam-engines: “Things are in the saddle / and ride mankind.” Is not what he said then even truer of today's information technologies that pull us away from earth into the digital cloud?

In contrast to this, here is Robert Frost, complements of Nicholas Carr: “Thought,” wrote Robert Frost, “has a pair of dauntless wings,” but “Love has earth to which she clings / With hills and circling arms about.”¹⁷²



The “liberal arts” – the arts suitable for a free man , as opposed to a slave.

Though I do not qualify as an elite, this is the kind of educational foundation I would seek and do seek to give to my own children – primarily because I believe that a life well-lived is a life that is earthy, and well-grounded in the world God made. Further, I believe it will help them to be a slave neither to their desires¹⁷³ – ever tempted by the siren’s song – or those who would see them first as data and not know them as persons.

Could it perhaps be that reasons like these are why the elites of times past all strove to give their children a classical liberal arts education – one that insisted that timeless and permanent things existed – even realized on earth now – and were the most fundamental of things?

Because they knew its true value, and because they wanted their children to know the arts – not just technical or professional skills – that were “suitable for a free man” – as opposed to a slave?¹⁷⁴ *Will those who avoid slavery today (hopefully not at the expense of others!) be those who have avoided an education that at the very least has dealt with these things in some way? I don’t think so.*

X. Concluding thoughts

What we call Man’s power over Nature turns out to be a power exercised by some men over other men with Nature as its instrument... For the power of Man to make himself what he pleases means... the power of some men to make other men what they please....[...mere nature to be kneaded and cut into new shapes for the pleasures of the masters who must, by hypothesis, have no motives but their own ‘natural’ impulses...] If man chooses himself as raw material to be manipulated, raw material he will be: not raw material to be manipulated as he

fondly imagined, by himself, but by mere appetite, that is, mere Nature, in the person of his dehumanized Conditioners.....

*– C.S. Lewis, *The Abolition of Man* ¹⁷⁵*

In this conclusion I will say no more about specific things I think libraries should do. I think that by now, it should be rather clear that I see libraries within a certain frame of reference – one that I have attempted to make clear – and it is enough for me to put forth the idea that all of our decisions should be made thoughtfully – and, I humbly submit, at least seriously considering the frame of reference that I have put forth.

*But there is a great and arduous challenge in front of us, because the MSTM is strongly held, seemingly intractable. The movie *Star Trek: First Contact*, from several years ago now, illustrates this with particular force.* In this film, mankind is threatened by the “uncanny” Borg¹⁷⁶ – a compelling and disconcerting enemy. In this particular episode, the leader of the Borg has taken on the form of a human female, the Borg Queen. The ship’s Captain, Jean Luc Picard, is “assimilated” by the Borg as is the rest of Picard’s crew. There is one character, however, who remains to be assimilated: the good android, Data. While the collective entity of Borg, exemplified by the Borg Queen, wants to draw life out of the living like a parasite (like a vampire), killing their victim and effectively reproducing itself, Data is not alive and so cannot be assimilated. But as watchers of this science fiction series know, Data desires to become a human being, and so here, the Borg Queen offers Data what he has always wanted: human flesh, by means of implanted skin on his face and forearm. For a while, it appears that Data is all in with the Borg Queen, seduced by the pleasure of feeling truly alive. However, *in the end, Data comes though, rejecting the Borg Queen and saving Captain Picard and his crew. As the author of the article, Justin Everett, points out, “it is, ironically, Data’s choice that shows him to be the most human of all, in spite of his losing his chance to be, at least in part, corporeally human. His choice... is clearly accentuated in this scene.”*¹⁷⁷



Star Trek’s Picard to the Borg Queen: “It was not enough for you to assimilate me. I had to give myself to you willingly.”

This is a nice picture of a good “robotic moment” (not the way Sherry Turkle uses the phrase) *par excellence* where the machine, Data, is the salvation-winning hero of the story. Evidently, Data here shows even more humanity than Captain Picard, who at one point in the movie, recalling his own assimilation, stated: “It was not enough for you to assimilate me. I had to give myself to you willingly.” One might draw a parallel here with the biblical story of the Garden of Eden. Where Adam and Eve fell by not trusting in God (Satan: “Did God really say?”), Data, exemplifying the best of humanity, is able to overcome temptation and save humanity (the Enterprise crew) through his own “human” actions.¹⁷⁸

This final hope in science and the technological – typical of the MSTM – also mirrors the end of Aiden and Jean-Baptiste’s book *Uncharted*. Speaking of Isaac Asimov’s idea of predicting the future from his *Foundation* series, mentioned also at the beginning of this presentation, they note that sociology found its beginnings in the early 19th century man Auguste Comte, who had hopes mirroring those of Asimov. “Careful empirical study would eventually reveal the laws that governed the operation of human society.... [there are] underlying mathematical principles...” (210) They note that sociology, in fact, was originally called “social physics”. *Aiden and Jean-Baptiste give voice to many when they say: “Maybe, just maybe, a predictive science of history is possible. Maybe, just maybe, our culture obeys deterministic laws. And maybe, just maybe, that is where all our data is taking us.”* (211, 212)

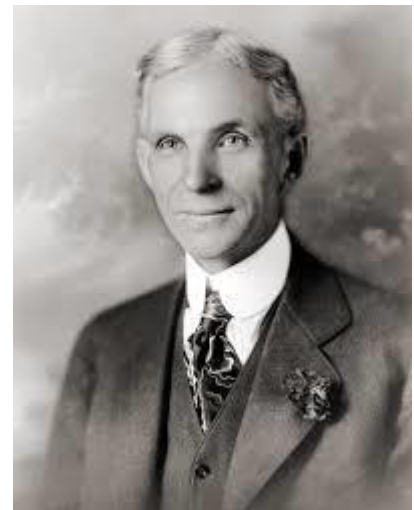
But for them, data does not save us wholesale like Data from Star Trek does. They want to make more room for the truly human and so quote the anthropologist Franz Boas saying:

The physicist compares a series of similar facts, from which he isolates the general phenomenon which is common to all of them. Henceforth the single facts become less important to him, as he lays stress on the general law alone.

On the other hand, the facts are the objects which are of importance and interest to the historian... Which of the two methods is of a higher value? The answer can only be subjective...” (pp. 208-212)

Quibbles about simplistic formulations aside, I think this approach is misguided and that history is clearly more fundamental than physics. Why? John Cohen, in his 1967 work, *Human robots in myth and science*, gives us a clue: “[some claim]...for prognosis, history is never necessary’. This may be true for an automobile. It is not true for the driver.” (p. 135) This is exactly right – the practice of physics, is, and always must be, contained within the living and pulsing events of human history – passed down in living memory (even as understandings may be deepened and refined through good empirical work) and not vice versa – even if things like n-grams tempt us to think so!

No, there is a clear order of precedence here: were it not for history, there would be no modern physics. Without modern physics, there still would be history. And without modern physics we are human beings but without history we are not.¹⁷⁹ And Cukier and Mayer-Schoenberger are simply wrong and careless to say “The possession of knowledge which once meant an understanding of the past, is coming to mean an ability to predict the future”.¹⁸⁰ Without modern physics, we would still have knowledge but this would not be the case without history.¹⁸¹



Henry Ford, giving voice to many more “scientifically inclined” persons: “History is more or less bunk...” (at least insofar as accounts of the past that come down to us are something that are of any real relevance for us – much less that we should be putting our trust in things like these!)

One might ask, why can we not, like Schumacher, make these into a couplet? History *and* physics? The answer is that these things, again, are not alike: physics does not even deserve to be on the same playing field. When it makes a play to be an “equal” – or rather, when human beings make this play – problems have already begun. As they look to move physics to the top position – perhaps even subconsciously – they will find themselves reciting a very different history, with very different facts elevated to the fore. And *ironically, assuming a continual dominance of the importance of physics, those with eyes to see can actually predict the future to some extent, as the “natural consequences” of a devotion to physics become a self-fulfilling prophecy. See again Lewis above.*¹⁸²

And of course it is only because we have a real history – and one that is largely knowable (that as Aiden and Jean-Baptiste point out, we seem to be forgetting with increasingly velocity) – that we also have and a real human future. And with this note about the future, we are brought full circle back to the beginning of this presentation: the relation of the “machine” and prediction.

Today, one will often hear about people being on the “right side of history”. But what does this mean and how can anyone know? People do not say this because they have any sort of confidence from some divine revelation from God. Rather people believe this because they are confident there is a system that aligns with what they consider their truest and best feelings and allows them to accurately predict – even if one can talk about individual choice and freedom within the system - history’s general arc...

Nowadays there might be far more effort to dress it up, make it more organic, soft, and “natural”, but the underlying fact remains the same: we are, in large part, a part of a system. A predictable system. A system under the control of some humans. A machine, though perhaps a kind of organic machine. Concepts such as “information technology” and *some* notions of what Big data is and will be simply reinforce this viewpoint – subscribed to either subconsciously or consciously – and take it to the next level. Again, as I said in the beginning: by treating the cosmos as a machine and by carefully observing it, mathematical formulas can be “captured” and used to make predictions about it.

This includes people as well – who may, without too much concern, be reduced to their data. *MSTM, ever pragmatic and reductionistic, will stop at nothing to make sure that there are no limits for the Controllers – those who understand how the cosmos works and will “work with it” as they please. Again, things like “information technology” and Big data can be seen, just like the physical automata, as a symbol – a microcosm – of what the MSTM sees (at the very least in practice) as the cosmic machine, our “final frontier”. And again, this “mechanical muse” is surprisingly alluring – often surprisingly “free”. It seems clear to me that unless there is some other strong, counterveiling belief that holds controlling precedence over this general view, how we behave – how we treat the universe, the things within it, and especially the persons we know - will, generally speaking, impact deeply what we find ourselves believing.*

To say so is to not say anything really unique. It is simply to point out what some of the classical and ancient philosophers have been saying throughout history. Christians have always said something similar about their worship: “*lex orandi, lex credendi*”, that is, the “law of prayer” – which has to do with what we say and do – affects the “law of belief”.

But as I said, this is a deeply secular mediation and so I best not go much further.¹⁸³ I'll close with a short bit of God-talk" – what little persists among the elites in our secularized age - quoted in the *Second Machine Age*:

"Technology is a gift of God. After the gift of life it is perhaps the greatest of God's gifts. It is the mother of civilizations, of arts and of sciences."¹⁸⁴

In the proper context – with a few nuances – I think I could make that statement into something I could say "Amen" to. Thank you for your time.

Appendix: Why Big data is not “good enough” for the library’s soul – or yours

Librarians are like any other human being in that they like to feel that they have some control – some order! – over the chaos (OK, it is probably more so for us). And right now, many in the library world, seeking out a stable rock, seem to be falling over themselves to get more involved with things like MOOCs and Big data – perhaps the “evidence-based” and “data-driven” stallions we want to attach our carts to! I think this is rather akin to sleeping with the boss – or the person perceived to be the boss – in hopes of economic and political gain (i.e. that they to, might be “big” or at least “bigger” in the world). But when it comes to looking for whom to hook up with, there are solid persons – “men with chests”, as C.S. Lewis once put it – and there are the players who eventually leave you in the lurch.

My mind has been on C.S. Lewis a lot lately, the literary giant and foremost Christian intellectual of the 20th century. Getting ready for this library technology presentation, I had composed a rough draft of 40 some pages – with 32 pages of additional footnotes (at end it is 89 total pages). My mind was brought back to Lewis and his ability to saliently communicate his point to most everyone in a few, well-chosen words – using good analogies and illustrations to make understanding big ideas possible.

Follow me here as I try to be like Clive. First of all, let’s notice that the idea of Big data grows out of the scientific method and that matters of science and technology are rich fodder for science fiction, a favorite genre of librarians. I think we would be wise to note that in science fiction, as the cultural historian of religions Robert M. Geraci says, we constantly see two intertwined themes: *not human control and success* but rather *salvation and damnation* by technology. In his memorable words: “fear of technological wrath accompanies the hope of a new Eden”. Along with this, he notes that we feel both “fear and fascination” in the presence of advanced robots. Why might this be?

The answer is bit complex, but I think is actually quite clear – and it is amazing how it connects up with notions of Big data. We can observe that the desire to create robots, or “automatons”, is a familiar theme in human history, and during the age of the Enlightenment mechanical automatons became not only an “emblem of the cosmos”, but a symbol of man’s confidence that he would unlock nature’s greatest mysteries and fully harness her power. And yet only a century later, automatons had begun to represent human repression and servitude, a theme later picked up – as noted above – by writers of science fiction. Western man’s ultimate confidence was undeterred however, and now it seems that the endgame of the modern scientific and technological mindset (or MSTM) is increasingly coming into view – the rise of “information technology” in general and “Big data” in particular signal this.

In the rest of this article I’ll explain a) why I think the endgame of the MSTM syncs with Big data and is becoming ever more clear ; b) how this mindset is distinct from science and technology *per se* ; and c) how libraries must recover and use good, classical philosophy to shun MSTM while using science and technology with wisdom and discernment.

Let’s start exploring MSTM by means of Big data and robots. In their recent book, *Uncharted: Big data as a Lens on Human Culture*, scientist-humanist hybrids Erez Aiden and Jean-Baptiste Michel begin by asking a provocative question: what if there was a robot that could be programmed to read all of the world’s books and then tell you what it had read? They then let you in on the surprise – there really is

such a robot, and it is none other than Google's n-gram viewer, which allows users to query – in the millions of books that Google has scanned – word and phrase frequency over a period of the last 200 years.

Leave aside for now the issue whether or not that robot, like IBM's "Watson", is really "understanding" or "telling" anything. Whatever the case, surely the technology that allows us to do things like this and more, is, as Eric Brynjolfsson and Andrew McAfee note in their new book, *The Second Machine Age*, "a gift of God". They continue this quote from Freeman Dyson, who also says that it is "perhaps the greatest of God's gifts". I am not so sure I can go as far as the second quotation does. Perhaps it has something to do with the little known fact that a substantial amount of the innovation that happens on the internet comes directly out of the pornography industry: evidently the desire for sex and money are two things that, to a large degree, inspire and drive technological development.

I am going to continue talking about porn here, and I promise that I am not doing that to keep your attention, but that I will have a larger point. Of course, this industry is giving people what they want, and the choices that they want – that is, the visual allure of particular human bodies (and perhaps, in the future, much, much more). Why does it all happen? It is simple really: the consumer of pornography consumes for the purposes of making himself (or, increasingly, herself) feel better – seeking the ever-fleeting promise of emotional and physical intimacy and, importantly, "feeling alive" – salvation. On the part of the porno-pushers, it means that they get to do what they love as well as consume the pocketbooks of the consumers – so long as they have a workable business model. It's a win-win for everyone and when "done right", no one gets hurt – or so it seems to those involved.

So what is the larger point? Well, does pornography have anything in common with computers – with "information technology" and the MSTM? It does. Consider the following: how do computers – which we can really just call robots – "know" us? I think it is easy to see how. Recently, in an interview with the director of the New York Public library tech-culture guru Jaron Lanier, when asked to share seven words that might define him, answered in a joking but semi-serious way, "our times demand rejection of seven word bios." Doing that, Lanier explained, is a form of disempowerment because "you are creating database entries for yourself [i.e. "putting yourself in standardized forms"] that will put you into somebody's mechanized categorization system." As stated in Don DeLillo's award-winning 1985 fictional novel "White Noise": "...you are the sum total of your data. No man escapes that."

Today, the world's most powerful computers "harvest", analyze, and build intricate computational models with your data – with all the other data – not only to spy, buy and/or sell, but to use as leverage to automate more and more work, push risk on to others, etc. As Jaron Lanier says, "Big data is people in disguise" – whoever we are talking about. But those in charge of sizing up your data will be tempted to increasingly determine your value according to it alone, just as the porn stars' are really only measured by their pixels. In other words, never before has the phrase "nothing personal – just business" been truer.

If this doesn't sound too concerning to you, consider in more detail just what is happening already, and will be so more and more: the robots who do this operate using the "useful fiction" – or, more

accurately, the ones programming the robots do this – that through a combination of some information about yourself – culled from structured and unstructured data sources – and some workable mathematical models and algorithms, you can be known – insofar as necessary for the goals they think best (and how can you doubt that they care?). Yes of course, maybe the maker can't *really* understand *you* on a deep level, but the maker, through the robot, can see evidence of what you do. And that is all he needs: taking account of this “works” for him regarding the things *he* wants to do: sell things to you, push risk on to you, prevent terrorism, perhaps even genuinely help you, etc.* It is all “good enough”.

Even if by this time, real trust in other human beings is in the process of leaving the building – even if it is something we are slow to detect, this continual encroachment of the MSTM's fruit.

Anyone who knows something about the origin of computers should not find it surprising that some who use powerful computers are tempted to reduce what is complex into a false simplicity. Alan Turing invented the computer based on his own idea – his own model – of how the brain operated and how human beings communicated. After the computer begin to dominate our lives, it became more and more common to think about the brain – and our own communication as human beings – in terms of the computer itself and computer networks. As far as it pertains to academia, this happened in the sciences as well as the humanities. Jaron Lanier even talks about how words like “consciousness” and “sharing” have been “colonized” by Silicon Valley nerd culture. Can we say that as we increasingly give ourselves to technology without reflection and personally constructed levies, we see that it is not so much that the robots resemble us, but that we resemble the robots?

Are we, no longer intimidated by computers, simply just getting used to this – this soft mechanical touch? And really – who are our electronic devices (our “little robots”) – and all our online accounts – primarily there for?

I think that one can also see with increasing clarity how the MSTM affects us as we live out our economic lives. In her helpful *Chronicle of Higher Ed. piece*, Jane Robbins, speaking of the phenomena of “Massive Open Online Courses” or MOOCs, makes the following observation: “[MOOCs] retain their indifference to admission criteria (for now, although there is some movement toward elite MOOCs) and to retention, which means they don't really care about *whether* students complete or not—but they do care about *who* completes, and *why* (or why not), and perhaps *what* can (or cannot) be successfully taught this way”. Here we see all of education – enhanced by the powers afforded it through technology – reduced to the crassest of business concerns in a rather extreme way. In the ancient world, there were certainly many traveling teachers who were happy to take your money. And yet, in their business model, they had to pay some attention to you – they *had to* treat you as a valuable individual (even as most would not have cared one lick about the notion of providing education for all persons).

So is the problem science and technology? No – in fact, I think both Big data and MOOCs are likely able to be formed and used in good ways –with proper limits in mind. The question is “what is technology for”? My own answer, which I think is the right one, is that technology – like politics – should be for serving my neighbor. In politics, I should “vote for the other guy” and with technology, I should,

through careful and thoughtful application (something akin to permaculture), look to serve my neighbor, and to do good for him and to him. But here is where we run into the crux of the problem: what we call the public good today is not understood to relate to *the good*, but rather *what “works”*. In other words, the “public good” today can best be understood as “the aggregate sum and fulfillment of as many individual’s desires as possible”, and this also is a result not of science and technology *per se*, but the MSTM.

What that has come to mean in today’s economy – looking more like a factory farm everyday – is that we need to be thinking first and foremost about efficiency and productivity – and if some individuals get run over by the locomotive known as the “technological imperative”, so be it. What can be done will be done indeed, as more traditional ways of feeling and thinking and living are blown apart and subsequently “re-purposed”. A cartoon lampooning Big data says it well: an airline official says to an arriving customer: “Your recent Amazon purchases, Tweet score and location history makes you 23.5% welcome here”.

Is this MSTM-driven notion of the “public good” – again, with its implications becoming clearer and clearer day by day – a sufficient concept by which to understand the world, much less to govern society? Perhaps Jaron Lanier has part of the answer when he, raging against the machine, asserts that “we are not gadgets”, and “we are better off believing we are special and not just machines”. We can call this “Lanier’s wager”, after the scientist and philosopher Blaise Pascal’s more famous one.

The problem with Lanier’s wager is that it simply amounts to his own private opinion – it is a “privatized humanism” and therefore does not compel. The same holds true for the views of Karl Marx, who believed that the dehumanizing aspects of capitalism led to the “fetishization” of the world of objects – which would then replace human beings as the objects of our affection. These views do not compel because with them, there is nothing “outside of us” that would command our admiration and devotion. Here is where we return to C.S. Lewis, that most creative of men, whose mind had been deeply formed by the classical liberal arts. In his brilliant and more or less non-religious book, *The Abolition of Man*, Lewis basically contended that the MSTM (not his language) had the power to “abolish” man. He made his argument that Western civilization was destroying itself by using a few simple sentences from an English textbook for middle school students.

In this textbook, Lewis points out that its authors, when talking about a waterfall, are careful to point out that we cannot say that the waterfall is “sublime” in itself – that is, intrinsically – but we can say that the waterfall provokes sublime feelings in the one who observes it. Lewis first of all points out that as regards feelings, the word “humble” is a more apt description and from that point on he is off to the races. He spends some thirty pages arguing convincingly that this simple move on the author’s part – where an objective goodness and beauty outside of the human being has been denied – has disastrous consequences for our lives together. In one of Lewis’ more memorable lines he states: “We make men without chests and expect from them virtue and enterprise. We laugh at honor and are shocked to find traitors in our midst.”

Lewis points out that men like Aristotle firmly believed that the aim of education was to make the pupil like and dislike what he ought, and that, in reality, this kind of “content-pushing” in education cannot be avoided. The main thing Lewis is getting at here is what Robin Lewis expresses in a bit different way: “Appreciating some artifacts are good in themselves, and not merely because of what they *do* for us, is the first step towards a proper appropriation of the liberal arts.”

To say this is true today, of course, is an uphill battle. As Nancy Maxwell wrote in her book about libraries, *Sacred Stacks*: “One of the only definite laws governing the postmodern academic world is that there are no definite laws. Belief in an overarching reality – one that purports to be the same for everyone regardless of perspective or personal stance – is no longer accepted at face value”. Applying this fact to library’s practical responsibilities on the ground, she says: “If there is nothing absolutely the same for all, how can one organizing principle apply? Attempting to organize all of human knowledge into ten categories – or even a thousand categories – seems a futile, even impossible task.” Maxwell goes on to talk about how “despite these limitations on their ability to organize knowledge, a perception still exists that libraries manage the task well enough”.

Of course no one is denying that libraries could not improve on this, one of their core services. And yet, note what is at issue: insofar as they are fighting the currents described above, librarians are fighting a losing battle on this and other fronts as well. After all, as she notes “if every person on earth has a legitimate way of viewing and organizing the world, there must be at least that many organizing systems...” On the contrary, it is good to seek *a*, or sometimes *the*, *proper place* for all the *good objects that exist* – the noticeable and interesting things that are worthy of attention and appreciation – *even if not all recognize this*. Here, the insight of Hans Ulrich Gumbrecht, professor of Romance languages at Stanford University (the belly of the technological beast!) and author of “*Production of Presence: What Meaning Cannot Convey*” comes in handy: “there is probably no way to end the exclusive dominance of interpretation, to abandon hermeneutics... in the humanities without using concepts that potential intellectual opponents may polemically characterize as ‘substantialist,’ that is concepts such as ‘substance’ itself, ‘presence,’ and perhaps even ‘reality’ and ‘Being’.”

Geoffrey C. Bowker reminds us that “computers may have the data, but not everything in the world is given” (this is what the Latin *datum* means – something that “is a given”). This is true (hence Lewis spoke of education as “irrigating deserts”), and yet I think it is clear that Gumbrecht has a point as well – something like his approach is needed, and not only a “phenomenological approach”. Seemingly rigid taxonomies like those of Aristotle’s might unnerve us but what happens when the alternative means taking media guru Clay Shirkey’s phrase “metadata is worldview; sorting is a political act” – in a context increasingly skeptical about intrinsic goodness, beauty, justice and meaning – and mutating it into a mechanical act that “scales well”? (perhaps even under the guise that “the data are everything we need”, and “we do not even need to settle for models!”)

Those devoted to what have been librarianship’s core principles will increasingly need to search their souls, for as regards their venerable tradition it has already become “library science”. For example, “under the hood” technology that no one can understand is increasingly displacing instruction on the need to think hard about how real knowledge – and wisdom – might be organized and sought out by

taking the time to learn the ins and outs of difficult research. As it stands, the current *zeitgeist* of the MSTM and its friend big business subsumes academic libraries and those who support them: technology is mysterious, even magical, and we, data-driven to the nth degree, simply need to quickly get our “customers” (do they want to be “customers”?) the information that will work for them and their purposes. Because we all “know” that what matters is that it “works for me” – until it no longer does, or course.

It was not only “arch-conservatives” like Lewis that had noted this relentless march of the MSTM. Noting the continual ascent of the scientific worldview in the late 18th century, the great German writer, Johann Wolfgang von Goethe believed that classical languages, classical literature, classical arts – and all meaning, ethics, and notions of cultural maturation (*Bildung*) – would be replaced by modern science and technology, where every tool would be used to maximize the power of human being – or some human beings that is. And what this means again is that any intrinsic or objective notion of goodness, love, majesty, beauty, honor, justice and meaning must leave the building. History is also a victim, for as prominent spokespersons of Big data assert: “The possession of knowledge which once meant an understanding of the past, is coming to mean an ability to predict the future”.

Small wonder there is such little trust among us. And as we give ourselves over to the lure of these things – seeking the power of technology apart from its rightful purposes – we in fact yield to the same pragmatism and reductionism those wielding them are captive to.

And perhaps we have not even begun to see the MSTM’s most bitter fruit. I submit that authors like Martin Ford, Jaron Lanier, and Eric Brynjolfsson and Andrew McAfee are all being prophetic by making us more aware of how many are using technology to not only replace human muscle but the human mind, Big data being an integral part of this process. In spite of the sunny optimism that pours forth from Brynjolfsson and McAfee’s *Second Machine Age*, the writing seems very much to be on the wall: the encroachment will be relentless, as all must bow to the notion that what can be done must be done for progress’ sake – that is, the “technological imperative”, otherwise known as “Pandora’s Box”. This is why even persons associated with conservatism – men like N.Y. Times columnist David Brooks – can sum up the book by saying: “creativity can be described as the ability to grasp the essence of one thing, and then the essence of some very different thing, and smash them together to create some entirely new thing.”

Brooks may be being metaphorical here, but the wider point is that his notion of essence (he says “essentialists” will be rewarded in the new economy) would seem to have no relation to the classical views held by men like Socrates, Plato, Aristotle, and for that matter, those who wrote the Bible. Rather, the Brave New World is coming at us faster than ever before, where there is nothing that we currently call “good” that will not be up for grabs – at least in the minds of many. The science fiction writer William Gibson foresaw this in his 1984 novel *Neuromancer*, where, as in the 1927 silent picture *Metropolis*, certain characters experience liberation through technology but they are only able to do so because of the powerful corporate interests operating to the detriment of most persons. All of this is in fact, just like Lewis predicted in the *Abolition of Man*:

What we call Man's power over Nature turns out to be a power exercised by some men over other men with Nature as its instrument... For the power of Man to make himself what he pleases means... the power of some men to make other men what they please....[...mere nature to be kneaded and cut into new shapes for the pleasures of the masters who must, by hypothesis, have no motives but their own 'natural' impulses.] If man chooses himself as raw material to be manipulated, raw material he will be: not raw material to be manipulated as he fondly imagined, by himself, but by mere appetite, that is, mere Nature, in the person of his dehumanized Conditioners.....

Lewis' comments here about MSTM in his day take on even greater relevance in the age of "information technology" and "Big data" – and one need not believe that most all of today's elites are consciously trying to condition and enslave the masses to see the point Lewis is getting at.

It seems to me that, given the course we are all on, this looks to be our future. Contra Eric Brynjolfsson and Andrew McAfee, of course some men will be racing with the machines and not against them –the only questions are which men this will be, how they will race with the machines, and whether or not as a result of this process they will continue to act as men should.

Only some men will run with machines. Unless. Lewis was indeed a Christian, but again, his was by no means a Christian argument or an argument only Christians could understand. I suggest we all need to somehow get ourselves into the position where we can see the wisdom of what C.S. Lewis is saying. Somehow. We have been seduced by the MSTM, but what makes seduction evil is not its essence but its context. This surprisingly alluring "mechanical muse" of "information technology" and Big data need not serve as the microcosm of our Final Frontier. What we need – and can have – is a "good seduction" so to speak – one that is lasting and permanent, and one found by looking at our history. Come to think of it, not just librarians but each one of us – those in families, towns, cities, universities, and businesses – need that.

FIN

*That is almost always a *plural you* by the way – perhaps except when, for particular reasons, entities with particularly desirable quantities are desired. In any case, we are, generally speaking, talking about anonymized data here – this is, again, nothing personal. So this is in fact true whether it is a mass entity or a when particular entity – an "individual", that is being singled out. Even the pinpointed individuals are not treated as persons to be known.

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Introduction

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The Promise and Peril of Automata:

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Automata in the Age of Big data

Michel and Aiden presenting: <http://www.flickr.com/photos/ritterbin/5913327350/> ; Watson: http://commons.wikimedia.org/wiki/File:IBM_Watson.PNG ; Big data pic: http://upload.wikimedia.org/wikipedia/commons/7/7c/Hilbert_InfoGrowth.png ; Knight Rider: <http://ja.wikipedia.org/wiki/%E3%83%8A%E3%82%A4%E3%83%88%E3%83%A9%E3%82%A4%E3%83%80%E3%83%BC>

What is Technology?

Permaculture: <http://en.wikipedia.org/wiki/Permaculture>

....And Where is "It" Going?

Kiva robots: <https://picasaweb.google.com/lh/photo/pcH-VYdoUchLqT2Z1B47aQ> ; Baxter: http://en.wikipedia.org/wiki/Baxter_%28robot%29 ; Siri: <http://www.flickr.com/photos/craightonmiller/6796556900/> ; Google car: <http://www.flickr.com/photos/donotlick/5226577623/> ; Redbox: <http://en.wikipedia.org/wiki/Redbox>

...And Quo vadis Librarians?

MOOCs pic: http://en.wikipedia.org/wiki/Massive_open_online_course

Ethical Issues with Information Technology

Terms of agreement: <http://www.flickr.com/photos/factoryjoe/4056383619/> ; Jaron Lanier: http://es.wikipedia.org/wiki/Jaron_Lanier ; Maxwell's Demon: http://en.wikipedia.org/wiki/Maxwell%27s_demon

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I think Therefore You Aren’t?: Philosophical issues

Big data cartoon http://en.wikipedia.org/wiki/Big_data ; Frog in kettle: http://en.wikipedia.org/wiki/Boiling_frog ;

What *Should* Libraries Do? (Reflections and Recommendations for Discussion)

All this technology is making us antisocial (unknown) ; Harry Bate’s Pandora: http://en.wikipedia.org/wiki/Harry_Bates_%28sculptor%29 ; Assess This (Assimilate This): <http://startrek space.blogspot.com/2012/03/technobabble.html> ; Hobbits : <http://www.flickr.com/photos/galaxyfm/583137557/> ; Slave: http://commons.wikimedia.org/wiki/File:ValentinGalochkin_1965_Slavery.jpg

Concluding Thoughts

Ford: http://en.wikipedia.org/wiki/Henry_Ford ; Data and Borg Queen: <http://www.treksinscifi.com/trekdaily/?p=123> ; Picard and Borg Queen: <http://www.startrek.com/article/first-contacts-borg-queen-alice-krige> ; Locutus: http://en.wikipedia.org/wiki/Borg_%28Star_Trek%29

¹ Brooks, David. "What Machines can't do." *New York Times*, Feb 04, 2014, Late Edition (East Coast)

² Aiden, Erez, and Jean-Baptiste Michel. 2013. *Uncharted: Big Data as a Lens on Human Culture*. New York? : Riverhead Publishing, p. 208.

³ Greek philosophy brought the notion of a discernible order to the forefront, and I submit that Judeo-Christian theology – with its notion of a loving God giving us an ordered world out of His love – spurred on modern science as it gave man the confidence to discover and ever more fully harness and work with the order that God had provided for our good.

⁴ Paul Krugman said he became an economist because it was the next best thing to being a psychohistorian. Courtney Comstock, "Paul Krugman Became an Economist to Be Like His Science Fiction Hero," *Business Insider*, February 22, 2010, accessed March 13, 2014, I <http://www.businessinsider.com/paul-krugman-became-an-economist-to-be-like-his-science-fiction-hero-2010-2>.

⁵ Even though this jolted me at the time, I would suggest that anyone familiar with the history of science should be able to get some sense of how such an idea could have taken hold in the Western world.

⁶ "Smack in the middle of the 14th century, as historians of science such as Lynn White Jr have written, the weight-driven clock captured the imagination of Europe. The civic pride which expended itself in the building of towering cathedrals in cities and towns transferred quickly to the construction of enormous astronomical clocks.

And these clocks did not just track the hours.

'No European community was able to hold up its head,' wrote White, 'unless in its midst the planets wheeled in cycles and epicycles, while angels trumpeted, cocks crew, and apostles, kings, and prophets marched and countermarched at the booming of the hours.'

The fascination with the great clocks presaged a change in the mindset of Europeans, White argued, a mindset that was turning away from the universe of the Greeks and beginning its journey toward the Scientific Revolution.

By 1319-20 a novel theory of impetus was emerging, transitional between that of Aristotle and Newton's inertial motion. Under the older concept, nothing moved unless it were constantly pushed by an outside force. Under the new physical theory, things keep moving by means of forces originally imprinted on them, by *vis impressa*. Moreover, regularity, mathematically predictable relationships, facts quantitatively measurable, were looming larger in men's picture of the universe.

The clockwork universe is a metaphor often attributed to Newton's era. But it was in the same century as the clock's invention, in the year 1382 to be precise, when Nicole Oresme, the Bishop of Lisieux (and a groundbreaking mathematician), first described the universe as a vast mechanical clock created and maintained by God.

It was, as White said, a 'notion with a future'. The metaphor became its own metaphysics."

John Farrell, "Scorsese's 'Hugo' and the Mechanical Universe," *Forbes*, January 26, 2012, accessed Mar 13, 2014, <http://www.forbes.com/sites/johnfarrell/2012/01/26/scorseses-hugo-and-the-mechanical-universe/> .

⁷ An interesting quote in this regard: "We may regard the present state of the universe as the effect of its past and the cause of its future. An intellect which at a certain moment would know all forces that set nature in motion, and all positions of all items of which nature is composed, if this intellect were also vast enough to submit these data to

analysis, it would embrace in a single formula the movements of the greatest bodies of the universe and those of the tiniest atom; for such an intellect nothing would be uncertain and the future just like the past would be present before its eyes." Laplace, Pierre Simon. 1952. *A philosophical essay on probabilities*. New York: Dover Publications.

In an email message to the author from November 2013 from now retired University of Chicago librarian David Bade he commented on this quote: "Laplace's 'demon' (as the above intellect came to be known) is the foundation of Big Data research and rhetoric. The irony is that Big Data promises the power to manipulate and control, but is based on Laplace's theory of an absolutely deterministic universe in which manipulation and control are the myths of creatures in a world bereft of any freedom of action, much less control over the world which determines their everything."

⁸ Wikipedia contributors, "Bildung," *Wikipedia, The Free Encyclopedia*, <http://en.wikipedia.org/w/index.php?title=Bildung&oldid=598918473> (accessed March 15, 2014).

⁹ Noland, Martin R. 1996. *Harnack's Historicism: the Genesis, Development, and Institutionalization of Historicism and its Expression in the Thought of Adolf Von Harnack*. Thesis (Ph. D.)--Union Theological Seminary, 1996, p. 176.

¹⁰ Is Goethe perhaps overstating the case? Speaking about how to confront the dangers of "dataveillance", Rita Raley might have some words of caution for those who think like him today, at least in terms of making an effective critique: "Positioned as we are within the dataveillance regime, we cannot but employ the tactics of immanent critique, which depends not on an overstatement or overarticulation of totalizing control systems nor on a hyperbolized romance of the exploitation of these systems, but rather depends simply on ordinary action itself." *Italics mine*, Rita Raley, 139, "Dataveillance and Countervailance", in Gitelman, Lisa. 2013. *"Raw data" is an Oxymoron*. Cambridge, Massachusetts: MIT Press.

¹¹ A quote to lead off the Introduction in: Kang, Minsoo. 2011. *Sublime dreams of living machines the automaton in the European imagination*. Cambridge, Mass: Harvard University Press. <http://site.ebrary.com/id/10456099>.

¹² <http://www.thefreedictionary.com/automata>

¹³ This excellent web article from the Danish Council of Ethics does a nice job of covering in some detail some of the most well-known "cyborgs" in early literature, including the Pygmalion (Ovid, 43 BC – 18 AD), Golem (15th and 16th c. Jewish mythology), Homunculus (Paracelsus, 1493-1541) and Frankenstein (Shelley, 1818) myths: <http://www.etiskraad.dk/Temauniverser/Homo-Artefakt/Artikler/Kulturhistorie/Cyborger%20i%20den%20tidlige%20litteratur.aspx>

¹⁴ This is taken from page 48-9 of *The Jewish People's Dictionary of Jewish Words* by Joyce Eisenberg and Ellen Scolnic.

¹⁵ I would characterize the MSTM as being set on overcoming everything seen to be a limit, and being reductionistic and pragmatic in practice. I do not mean to imply that the MSTM was the dominant or most important mode of thinking for most of the early modern scientists (most early scientists were more tempered by competing systems of understanding – particularly religious ones – that would compete against drives such as these) or that it was fully developed in those for whom it was the dominant or most important mode of thinking. More specifically, we can look at the MSTM in this way. It begin with an approach to the world called "methodological (not necessarily philosophical) naturalism" in the 17th century, was upgraded to include

“pragmatic utilitarianism” in the 19th century, and has in recent years been upgraded to “systematic iconoclastic world-repurposing” towards man’s desires (late 20th and early 21st century). In some cases of course there were those who were “early adopters” of the upgrades. Again, what this all comes down to (endgame) is that we have behavior that can be described as being reductionistic and iconoclastic (limit and barrier breaking). This may leave us with some “laws of nature”, but also leaves us with moral lawlessness, where the ethical façade of the 19th c. “pragmatic utilitarianism” upgrade collapses altogether. At this point, we can say that there is nothing intrinsic about beauty, justice, and meaning, for example – i.e. beauty, justice, and meaning are only something that I/we (and those we choose to associate with) create / make / determine.

¹⁶ Truitt, E. R. 2012. “Sublime Dreams of Living Machines: The Automaton in the European Imagination - by Minsoo Kang”. *Centaurus*. 54 (2): 199-200.

¹⁷ Automats are said to be “uncanny” in that they combine both the familiar and unfamiliar and this cause all manner of psychological responses in us. See the footnotes found in the conclusion for more.

¹⁸ Perhaps this unease has to do with another thing that Kang suggests: like Adam and Even rebelling against their maker, we to wonder if it could happen to us to... The nice robots we know from modern fiction still have to deal with the presence of their perhaps more captivating evil counterparts.

¹⁹ Geraci, Robert M. 2007. “Robots and the Sacred in Science and Science Fiction: Theological Implications of Artificial Intelligence”. *Zygon*. 42 (4): 961-980, p. 969.

²⁰ Baraniuk, Chris, “Strong Silent Types: Evil Robots and Their Way with Words,” *The Machine Starts*, last modified January, 2013, <http://www.themachinestarts.com/read/2013-05-strong-silent-types-evil-robots-way-with-words>.

²¹ Geraci, Robert M. 2007. “Robots and the Sacred in Science and Science Fiction: Theological Implications of Artificial Intelligence”. *Zygon*. 42 (4): 961-980. 966

In the abstract of Geraci’s paper, we read: “Science-fiction representations of robots and artificially intelligent computers follow this logic of threatening otherness and soteriological promise. Science fiction offers empirical support for Anne Foerst’s claim that human beings experience fear and fascination in the presence of advanced robots from the Massachusetts Institute of Technology AI Lab. The human reaction to intelligent machines shows that human beings in many respects have elevated those machines to divine status. This machine apotheosis, an interesting cultural event for the history of religions, may—despite Foerst’s rosy interpretation—threaten traditional Christian theologies....”

Elsewhere, he writes:

“Science fiction is a useful tool for the explication of these modern problems because it is “the most accurately reflective literary genre of our time” (Schwartz 1971, 1043). As a literary form, science fiction bridges the sciences and the humanities (Schwartz 1971, 1044), which makes it vital to understanding the religion-science engagement with robotics and artificial intelligence. Moreover, science fiction has been of decisive importance to technological development (Brand 1987, 224-25; Pontin 2007), and this includes robotics and AI (Shivers 1999)....”

More on salvation and damnation:

“In seeking to describe the fundamental nature of the religious experience, [the modern theologian Rudolph] Otto gives us a coincidence of opposites: the *mysterium tremendum* and the *fascinans*. These opposites also

characterize twentieth-century technology, which frightens us with dehumanization and extinction while fascinating us with the “salvation” of a leisurely return to Eden.... (965) Science-fiction depictions of robots demonstrate that a fear of technological wrath accompanies the hope of a new Eden. (966)... Technology promises salvation with one hand while threatening damnation with the other. This coincidence of opposites appears most prominently in depictions of intelligent robots. (967)... In the end, robots in science-fiction movies demonstrate the persistence of the human being; it is through the opening of human emotion that the powers of technology are once again subsumed within human control... These happy endings are rarely secure, however, as the threat of robot dominance never truly dies. Human beings must content themselves with a tentative grip on their self-determination and self-identity, a grip that must be renewed regularly and retained only through constant vigilance. (968)”

Another interesting angle on humans and machine science fiction film: they really explore what it means to be human, and many of them suggest that human beings are cyborg-ian already. Read more in this excellent web article from the Danish Council of Ethics: <http://www.etiskraad.dk/Temauniverser/Homo-Artefakt/Artikler/Kulturhistorie/Menneske%20og%20maskine%20i%20science%20fiction-film.aspx>

²² *Ibid*, p. 966

²³ “...by definition ‘generally intelligent systems’ are self aware... these will ‘develop’ four primary ‘drives’” and “self aware [:] deep knowledge of its own design.” Barrat, James. 2013. *Our Final Invention: Artificial Intelligence and the End of the Human Era*. New York : Thomas Dunne Books, pp. 81, 172.

²⁴ One of the most well-known arguments against classical notions of A.I. is the “Chinese room argument” by the philosopher John Searle. One can hear more about it at <http://www.abc.net.au/radionational/programs/philosopherszone/minds-and-computers/3290844> and <http://www.abc.net.au/radionational/programs/philosopherszone/the-worst-argument-in-the-world/3962552>, but in brief, the argument is that understanding syntax is insufficient for understanding semantics. I would actually critique the Chinese room argument as well: it assumes one can somehow conceive of all the possible sentences in a language and compose a reasonable response to these. For the first part, Walt Crawford has argued, using Google itself, that most every ten word phrase on the internet is absolutely unique. As for the answer part, while this might seem to be true in most cases, there are also times where context is absolutely critical to obtaining a correct or sensible answer to a question.

More on Crawford: His observation suggests we should think twice about our abilities to not only identify hard-and-fast patterns (“laws”) regarding such things , but also to develop effective methods to “net” them. Geoffrey Nunberg writes “One salutary effect of looking at word trajectories is that they dispel some of the unreflective philological assumptions that color the way humanists and social scientists tend to think about words.” Nunberg, Geoffrey. “Counting on Google Books.” *Chronicle of Higher Education*, December 16, 2010.

<http://chronicle.com/article/Counting-on-Google-Books/125735/> ; more of the full quote from Walt Crawford: “If you're suspicious that a clumsy plagiarist has cut-and-pasted without paraphrasing, almost any medium-length sentence may suggest you should check further. It could be entirely innocent. But it seems surprisingly uncommon for the same 10-word string to show up more than once. Our everyday language is more varied and diverse than I think most of us expect.” Earlier, in his article, he had quoted a commenter on a blog who said, “it is highly likely that any given sentence you speak has never been used before, unless the sentence is short and about a common subject. It just seems like the same sentences get reused a lot because our brains are amazingly efficient at

distilling sentences down to their core meanings, which do get reused regularly." In Crawford, Walt. "The Uniqueness of Everyday Language." *Online* 34, no. 4 (July 2010): 58-60.

In sum, if someone in the future tells you a machine has "gone rogue" I would be very skeptical. I think it's a pretty good guess that the machine would not be the rogue.

²⁵ In current cognitive science this would mean that our minds would be the software that runs on the hardware of the brain....see Gelonesi, Joe. 2008. Minds and Computers. *The Philosopher's Zone*. podcast radio program. Sydney: ABC News Radio, January 12. <http://www.abc.net.au/radionational/programs/philosopherszone/minds-and-computers/3290844> (with guest Matt Carver) for more about this. Discussing the work of James Barrat who made the same point, retired University of Chicago librarian David Bade noted the following In an email message to the author from Jan 2014:

"What is so funny is that the author does not seem to understand that trying to model the thinking of the brain as set of algorithms was what led to the development of the computer. That working assumption was then taken to be the truth about the mind, a truth not to be question and critiqued in search of a better understanding, and thus the mind (not just the model of it) became an algorithm in the thinking of these scientists. And of course that means we can simulate it with computers.

Assumption: Let $x=y$; Definition: $y = a + b$; Conclusion: $x=a + b$

But if x does not equal y , then no such conclusion follows. The assumption that the mind was an algorithm was the foundation of computer science from the beginning but to date there is no evidence that the mind is an algorithm machine, only that computers are. The brain works; computers work (sometimes). Ergo, the brain is a computer. A triumph of logical thinking based on faulty metaphysical assumptions."

This brings some of the following statements to mind: "The reductionist, in asserting that the mental life of man can be wholly represented in terms of a neural automation, denies to him those very qualities which distinguish him from a robot" (Cohen, John. 1967. *Human Robots in Myth and Science*. South Brunswick [N.J.]: A.S. Barnes, p. 137). And this one as well from C.S. Lewis: "You cannot go on 'seeing through' things forever. The whole point of seeing through something is to see something through it. It is good that the window should be transparent, because the street or garden beyond it is opaque. How if you saw through the garden too? It is no use trying to 'see through' for principles. If you see through everything, then everything will be transparent. But a wholly transparent world is an invisible world. To 'see through' all things is the same as not to see." Lewis, C. S. 1996. *The Abolition of Man, or, Reflections on Education with Special Reference to the Teaching of English in the Upper Forms of Schools*. New York: Simon & Schuster, p. 87.

I am also told that Joseph Weizenbaum's *Computer Power and Human Reason* (1976) and Hubert Dreyfus' *What Computers Still Can't Do* (1992) are worth looking into for further reflection. Dreyfus also more recently wrote an updated article: Dreyfus, H.L. 2007. "Why Heideggerian AI failed and how fixing it would require making it more Heideggerian". *Artificial Intelligence*. 171 (18): 1137-1160.

²⁶ Cohen, John. 1967. *Human Robots in Myth and Science*. South Brunswick [N.J.]: A.S. Barnes.

²⁷ "If, in like manner, the shuttle would weave and the plectrum touch the lyre without a hand to guide them, chief workmen would not want servants." Quoted in Brynjolfsson, Erik, and Andrew McAfee. 2012. *Race Against the*

Machine: How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy. Lexington, Mass: Digital Frontier Press.

²⁸ From retired University of Chicago librarian David Bade in an email to me on March 17, 2014: "In *A l'image de l'homme*, Philippe Breton argued that throughout history in almost every case of attempts to create artificial humans, it was done by men in order to create the perfect slave to replace imperfect women. He shows this in Greek mythology, Chinese folklore (where a man paints a woman and brings her to life by loving her), and many later versions up to the virtual desktop girl. In this man-created world, women obey man in everything to meet his desires, they do not challenge him to grow and change and love."

²⁹ "O had I Father's gift I would breathe life / Into the lifeless earth, but who are we / To recreate mankind?" – Ovid, *Metamorphoses*, quoted in Kang, Minsoo. 2011. *Sublime Dreams of Living Machines the Automaton in the European Imagination*. Cambridge, Mass: Harvard University Press. <http://site.ebrary.com/id/10456099>. introduction. This motivation seems perhaps go hand in hand with the one expressed by AI maker De Garis in Barrat's *Final Invention*: "Humans should not stand in the way of a higher form of evolution. These machines are godlike. It is human destiny to create them." Barrat, James. 2013. *Our Final Invention: Artificial Intelligence and the End of the Human Era*. New York : Thomas Dunne Books, p. 86.

³⁰ In what seems to be a nod to more Freudian notions, Cohen says: "The entire world of machinery, as Huysman writes somewhere, is inspired by the play of the organs of reproduction. The designer animates artificial objects by stimulating the movements of animals engaged in propagating the species. Our machines are 'Romeos of steel and Juliets of cast-iron'."

He also notes this as a motive: "manifestations of those modes of consciousness which reach out for symbolic interpretation of the world around them in contrast to a factual, literal or scientific interpretation." Cohen, John. 1967. *Human Robots in Myth and Science*. South Brunswick [N.J.]: A.S. Barnes, pp. 67, 99

³¹ Geraci, Robert M. 2007. "Robots and the Sacred in Science and Science Fiction: Theological Implications of Artificial Intelligence". *Zygon*. 42 (4): 961-980.

³² Ariana Eunjung Cha, "'Big Data' from Social Media, Elsewhere Online Redefines Trend-Watching," *Washington Post*, June 6, 2012, accessed March 13, 2014, http://www.washingtonpost.com/business/economy/big-data-from-social-media-elsewhere-online-take-trend-watching-to-new-level/2012/06/06/gJQArWWpJV_story.html?hpid=z4.

³³ The following quote appears in the Executive summary: where I mention this issue more prominently: "Alan Turing invented the computer based on his own idea – his own model – of how the brain operated and how human beings communicated. After the computer began to dominate our lives, it became more and more common to think about the brain – and our own communication as human beings – in terms of the computer itself and computer networks. As far as it pertains to academia, this happened in the sciences as well as the humanities. Jaron Lanier even talks about how words like "consciousness" and "sharing" have been "colonized" by Silicon Valley nerd culture. Can we say that as we increasingly give ourselves to technology without reflection and personally constructed levies, we see that it is not so much that the robots resemble us, but that we resemble the robots?"

³⁴ Hand, Eric. "Culturonomics: Word Play," *Nature* 474, June 17, 2011 (published online): 436-440. <http://www.nature.com/news/2011/110617/full/474436a.html> , doi:10.1038/474436a

³⁵ Wikipedia contributors, "Big data," *Wikipedia, The Free Encyclopedia*, http://en.wikipedia.org/w/index.php?title=Big_data&oldid=599186097 (accessed March 12, 2014).

³⁶ Cumbley, R., and P. Church. 2013. "Is 'Big Data' creepy?" *The Computer Law and Security Report*. 29 (5): 601-609, p. 602

³⁷ Roberts, B. 2013. "The Benefits of Big Data ``Big data" can be challenging to acquire and use, but the rewards can boost business performance". *HR Magazine*. 58 (10): 20-30, p. 22.

³⁸ Gordon-Murnane L. 2012. "Big data: A Big Opportunity for Librarians". *Online*. 36 (5): 30-34.

³⁹ Jacobs, A. 6 July 2001. "The Pathologies of Big Data". *ACMQueue*, quoted in Wikipedia. Wikipedia contributors, "Big data," *Wikipedia, The Free Encyclopedia*, http://en.wikipedia.org/w/index.php?title=Big_data&oldid=599186097 (accessed March 12, 2014).

⁴⁰ Gordon-Murnane L. 2012. "Big data: A Big Opportunity for Librarians". *Online*. 36 (5): 30-34.

⁴¹ Jacobs, A. 6 July 2001. "The Pathologies of Big Data". *ACMQueue*, quoted in Wikipedia. Wikipedia contributors, "Big data," *Wikipedia, The Free Encyclopedia*, http://en.wikipedia.org/w/index.php?title=Big_data&oldid=599186097 (accessed March 12, 2014).

⁴² Ariana Eunjung Cha, "'Big Data' from Social Media, Elsewhere Online Redefines Trend-Watching," *Washington Post*, June 6, 2012, accessed March 13, 2014, http://www.washingtonpost.com/business/economy/big-data-from-social-media-elsewhere-online-take-trend-watching-to-new-level/2012/06/06/gJQArWWpJV_story.html?hpid=z4.

⁴³ Increasingly, big companies and governments are utilizing all of this big data. Small companies, more nimble and flexible, are said to be able to utilize big data in order to disrupt their larger competitors. For example, the refrigerator company Sub-Zero uses SAS software to search recordings of customer service calls for word pairs like "compressor" and "failure", and this evidently helps them greatly in their business. Holstein, W.J. 2013. "Technology Getting Smart With Big Data How smaller companies are becoming increasingly sophisticated about analyzing multiple forms of data". *Chief Executive*. (264): 44-48.

⁴⁴ "Any buzzword-type thing, you always feel like the bubble will pop and then people will be like, 'Oh, big data, that was the ridiculously overhyped concept back 10 years ago,'" Mr. Fergus says. "I think the fluffy stuff will pop, but the underlying rigorous stuff is here to stay. It really works, and it is used by real companies to make money."

Megan O'Neil, "As Data Proliferate, So Do Data-Related Graduate Programs," *The Chronicle of Higher Education*, February 3, 2014, accessed March 13, 2014, <http://chronicle.com/article/As-Data-Proliferate-So-Do/144363/>

⁴⁵ "As the chair of the Strata conference, I see a vital link between big data and semantic web, and have my own roots in the semantic web world. Earlier this year however, the interaction was not yet of sufficient utility to make a strong connection in the conference agenda." Edd Dumbill, "Big Data and the Semantic Web: at War, Indifferent, or Intimately Connected"?, *O'Reilly Data*, June 14, 2011, accessed March 13, 2014, <http://strata.oreilly.com/2011/06/big-data-and-the-semantic-web.html>

For a nice summary of the semantic web see this article from the *Encyclopedia Britannica blog*: Semantic web good article: <http://www.britannica.com/blogs/2012/12/the-semantic-web/>

Alistair Croll argues that semantic idealism fails because we are lazy – we don't tag all the things we should. This is why, he says, our machines are going to be designed to do the tagging for us – and that we will forget to do this ourselves. OCLCVideo. 2013. "Alistair Croll: Implications and Opportunities of Big Data." YouTube video, March 13. http://www.youtube.com/watch?v=lc_BIPesEls.

⁴⁶ Nicholas Carr pokes fun at what he sees as some obvious excesses of this here: <http://www.rough.type.com/?p=4003>

⁴⁷ Computational thinking: "Specific computational thinking techniques include: problem decomposition, pattern recognition, pattern generalization to define abstractions or models, algorithm design, and data analysis and visualization." Jonathan Rochkind, "Computational Thinking: Getting Started," *Bibliographic Wilderness* (blog), November 27, 2012, <http://bibwild.wordpress.com/2012/11/27/computational-thinking-getting-started/>.

⁴⁸ There are already many applications of big data that seem particularly impressive, and our automata are increasingly using it to our advantage. For example, U.P.S. is using big massive amounts of sensors on the various mechanical parts of their delivery trucks in order to help maintain them and get a jump on potential problems. Cukier, K., and V. Mayer-Schoenberger. 2013. "The Rise of Big Data How It's Changing the Way We Think About the World". *Foreign Affairs – New York*. 92 (3): 28-40. Another company is using real-time traffic data in order to make it possible to operate a profitable limo taxi service. OCLCVideo. 2013. "Alistair Croll: Implications and Opportunities of Big Data." YouTube video, March 13. http://www.youtube.com/watch?v=lc_BIPesEls. According to Laura Gordon-Murnane with big data and "big analytics" "it becomes possible to spot business trends, uncover ways to prevent disease, combat crime, add economic value, gain new insights in scientific research, and make government more transparent. Gordon-Murnane L. 2012. "Big data: A Big Opportunity for Librarians". *Online*. 36 (5): 30-34.

Technology and cultural writer Nicholas Carr is a bit more caustic in his evaluation, pointing out some of the more ridiculous claims: "The computer revolution, write the authors, Eric Schmidt and Jared Cohen, has "barely left the starting blocks." Soon we'll be blessed with "integrated clothing machines" that not only wash, fold and shelve laundry but "algorithmically suggest outfits based on the user's daily schedule." Robot barbers will give us haircuts that are "machine-precise." Nasal implants will alert us to oncoming colds. When we sense that our kids are getting spoiled, we'll be able to transport them, via holographic projectors, to a Third World slum for a stroll among the destitute. Nicholas Carr, "Nightmare of the Enthusiasts," *Rough Type* (blog), April 27, 2013, 10:48 AM, <http://www.rough.type.com/?p=3198>.

⁴⁹ <http://www.azlyrics.com/lyrics/2unlimited/nolimit.html>

⁵⁰ A book recommended to me on this topic: Breton, Philippe, David W. Bade, and Ronald E. Day. 2011. *The Culture of the Internet and the Internet as Cult: Social Fears and Religious Fantasies*. Duluth, MN: Litwin Books. <http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=361991>.

⁵¹ If a tool can conceivably be any physical object that one uses in one's hand to accomplish a purpose, technology involves not only using such an object creatively, but actually creating some sort of object.

⁵² And what an affect writing has on humanity as opposed to mere "orality" as Walter Ong called it. In a review of Nicholas Carr's book *The Shallows*, Fritz Nelson connects the effects that clocks have on us with the effects writing has on us: "Clocks.... changed us, making us think about the synchronization of work, schedules, and transportation, Carr says. "Once the clock had redefined time as a series of units of equal duration, our minds

began to stress the methodical mental work of division and measurement," he writes. Instead of the simple obligatory nod to the invention of the printing press, Carr provides a more anthropological study of books. For example, historically most reading was done aloud; silent reading came much later, and arrived as a revelation; it let the reader explore the meaning behind the words. Also, there were once no spaces between written words, and no rules about word order; these, too, came later." Nelson, Fritz. "Nicholas Carr's 'The Shallows'." Review of *The Shallows*, by Nicholas Carr. *Information Week*, June 3, 2010, 16. Accessed March 13, 2014, <http://www.informationweek.com/applications/book-review-nicholas-carrs-the-shallows/d/d-id/1089675?>

⁵³ Townsend, Anthony M. 2013. *Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia*. New York: W. W. Norton & Company, pp. 159-160.

⁵⁴ Brynjolfsson, Erik. 2014. *Second Machine Age: Work, Progress, and Prosperity in the Time of Brilliant Technologies*. [S.I.]: W W Norton, p. 162.

⁵⁵ See, for example, Brynjolfsson, Erik, and Andrew McAfee. 2012. *Race Against the Machine: How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy*. Lexington, Mass: Digital Frontier Press, p. 36

⁵⁶ Some example of the more impressive innovations that illustrate the kind of technology that is now possible: "cars that drive themselves in traffic, Jeopardy!-champion supercomputers; autogenerated news stories; cheap, flexible factory robots; and inexpensive consumer devices that are simultaneously communicators, tricorders and computers." Brynjolfsson, Erik. 2014. *Second Machine Age: Work, Progress, and Prosperity in the Time of Brilliant Technologies*. [S.I.]: W W Norton, p. 48.

⁵⁷ *Ibid*, p. 145.

⁵⁸ *Ibid*, pp. 49, 55.

⁵⁹ Barclay, Paul. 2013. *Morals and the Machine. Big Ideas*. podcast radio program. Sydney: ABC Radio National, October 3. <http://www.abc.net.au/radionational/programs/bigideas/morals-and-the-machine/4881302>

⁶⁰ Brynjolfsson, Erik, and Andrew McAfee. 2012. *Race Against the Machine: How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy*. Lexington, Mass: Digital Frontier Press, 52

⁶¹ Solman, Paul. 2014. In 'Second Machine Age' of Robots, it's Time for Humans to Get Creative. *PBS Newshour*. television program. United States: PBS, March 13. <http://www.pbs.org/newshour/bb/second-machine-age-will-require-more-human-creativity>

⁶² Here is perhaps a more extreme prediction regarding "natural language processing" from James Barrat: "Advances in natural language processing will transform parts of the economy that until now have seemed immune to technological change. In another few years librarians and researchers of all kinds will join retail clerks, bank tellers, travel agents, stock brokers, loan officers, and help desk technicians in the unemployment lines. Following them will be doctors, lawyers, tax and retirement consultants. Think of how quickly ATMs have all but replaced bank tellers, and how grocery store checkout lines have started phasing out human clerks. If you work in an information industry (and the digital revolution is changing everything into information industries), watch out.

Here's a quick example. Like college basketball? Which of these two paragraphs was authored by a human sportswriter...." Barrat, James. 2013. *Our Final Invention: Artificial Intelligence and the End of the Human Era*. New York : Thomas Dunne Books, p. 225.

⁶³ "In a traditional market, someone who is 90 percent as skilled or works 90 percent as hard creates 90 percent as much value and can thus earn 90 percent as much money. That's absolute performance. By contrast, a software programmer who writes a slightly better mapping application – one that loads a little faster, has slightly more complete data, or prettier icons – might completely dominate a market.... Ten mediocre mapping tools are no substitute for one good one. When consumers care mostly about relative performance, even a small difference in skill or effort or luck can lead to a thousand-fold or million-fold difference in earnings." Brynjolfsson, Erik. 2014. *Second Machine Age: Work, Progress, and Prosperity in the Time of Brilliant Technologies*. [S.l.]: W W Norton, p 153.

⁶⁴ From that same program Matt Miller notes that maybe it was a "Luddite fantasy" that all jobs would be lost to machines for the first 200 years of capitalism.... but now, as explored in the program, "digitization creates superstars who can replicate their talent, or maybe their luck, across millions of consumers and automate the jobs of people who are doing routine information processing to the point where they aren't really essential to production anymore...." Miller, Matt. 2013. The Robots Are Coming! *This...Is Interesting*. podcast radio program. Santa Monica: KCRW News, Apr 19. http://www.kcrw.com/news/programs/in/in130417the_robots_are_comin (with guests Martin Ford and Eric Brynjolfsson)

Jaron Lanier notes:

"Unions fought for pay and working conditions that turned driving jobs into middle-class ones. In this century, however, we have forgotten that wisdom and decided that when it comes to digital networks, more and more people will not be paid for what they do even though what they're doing is needed.

Jobs involving communication and expression (music, journalism and so forth) are suddenly much harder to come by, because information is now held to be free. Naturally, a 19th-century trope, the Horatio Alger story, has reappeared. With enough hard work, opportunity is said to be around the corner for young journalists and musicians. Alas, there are only a few genuine success stories. Almost everyone else in the game lives on false hope, accepting the benefits of an informal economy — reputation and barter — while helping a small, distant elite build real wealth. Instead of a bell curve, the distribution looks like a razor-thin skyscraper dragging an emaciated "long tail" behind it.

The fate of journalism and music awaits every other industry, and every kind of job, unless this pattern is undone. As this century unfolds, technology will continue to evolve. More and more activities will be operated by software. Instead of Teamsters, there will be robotic trucks. Where there had once been miners, there will be mining robots. Instead of factories, there will be 3-D printers in every home. Experimental robots have already outperformed many a white-collar worker, including the legal researcher, the pharmacist and the scientific investigator.

Lanier, Jaron. "Fixing the Digital Economy." *New York Times*, Jun 09, 2013, Late Edition (East Coast).

⁶⁵ All forms of automation ultimately rely on data that come from people.... There is no magical "artificial intelligence." When a big, remote computer translates a document from English to Spanish, for instance, it doesn't understand what it is doing. It is only mashing up earlier translations created by real people, who have been forgotten because of the theater of the Internet.

There are always real people behind the curtain. The rise of inequality isn't because of people not being needed — more precisely, it's because of an illusion that they aren't even there.

DISSECT almost any ascendant center of power, and you'll find a giant computer at the core. In the past, power and influence were gained by controlling something that people needed, like oil or transportation routes. Now to be powerful can mean having the most effective computer on a network. In most cases, this means the biggest and most connected computer, though very occasionally a well-operated small computer can play the game, as is the case with WikiLeaks. Those cases are so rare, however, that we shouldn't fall into the illusion of thinking of computers as great equalizers, like guns in the Wild West.

The new class of ultra-influential computers come in many guises. Some run financial schemes, like high-frequency trading, and others run insurance companies. Some run elections, and others run giant online stores. Some run social network or search services, while others run national intelligence services. The differences are only skin deep. I call this kind of operation a "Siren Server."

Siren Servers are usually gigantic facilities, located in obscure places where they have their own power plants and some special hookup to nature, like a remote river, that allows them to cool a fantastic amount of waste heat.

Siren Servers calculate actions for their owners that reduce risks and increase wealth and influence. For instance, before big computers and cheap networking, it was hard for health insurance companies to gather and analyze enough data to be tempted to create a "perfect" insurance business, in which only those who need insurance the least are insured. But with a big computer it becomes not only possible, but irresistible.

Giant financial schemes are similarly tempting. It is commonly believed that deregulation motivated financial adventurism, but it can also be argued that Moore's law, which holds that computing becomes better and cheaper at an accelerating rate, guaranteed that sooner or later the temptations of using computation to displace risk would become irresistible.

Financiers caught the seductive whiff of digital perfection in the 1970s. The first major market crash at least partially attributable to automated trading came in 1987. Big computer-centric schemes like those hatched by Long Term Capital Management and Enron, laid down a pattern that continued with the Great Recession of 2007-9.

Lanier, Jaron. "Fixing the Digital Economy." *New York Times*, Jun 09, 2013, Late Edition (East Coast).

⁶⁶ Solman, Paul. 2014. In 'Second Machine Age' of Robots, it's Time for Humans to Get Creative. *PBS Newshour*. television program. United States: PBS, March 13. <http://www.pbs.org/newshour/bb/second-machine-age-will-require-more-human-creativity/#the-rundown>

⁶⁷ Kroft, Steve. 2013. Are Robots Hurting Job Growth?. *60 Minutes*. television program. New York: CBS News, January 13. <http://www.cbsnews.com/videos/are-robots-hurting-job-growth-50138922/>

⁶⁸ Ford, Martin. 2009. *The Lights in the Tunnel: Automation, Accelerating Technology and the Economy of the Future*. [U.S.]: Acculant Publishing, p. 97. Over the years, some have pointed out how it is a waste of effort and a "downright humiliation" for man to have to do what a machine can do. See Cohen, John. 1967. *Human Robots in Myth and Science*. South Brunswick [N.J.]: A.S. Barnes, pp. 113-114 where it talks about the prescient insight of Mary Boole, wife of the famous mathematician George Boole, writing in the early 1800s. That said, among good

men and women, it is probably even more humiliating to not have a job – and as Ford points out, it is not good for anyone.

⁶⁹ Keen, Andrew. 2014. The Second Machine Age. *Keen On*. television program. Silicon Valley: Tech Crunch, February 6. <http://techcrunch.com/video/the-second-machine-age-keen-on/518104664/>

⁷⁰ Listen to this interview between 12 and 15 minutes: Roberts, Russ. 2010. Brynjolfsson on the Second Machine Age. *EconTalk*. podcast radio program. Fairfax County, Virginia : George Mason University - Library of Economics and Liberty, Feb 3. http://www.econtalk.org/archives/2014/02/brynjolfsson_on.html

⁷¹ Brynjolfsson, Erik. 2014. *Second Machine Age: Work, Progress, and Prosperity in the Time of Brilliant Technologies*. [S.I.]: W W Norton, pp. 126 and 127

⁷² See the commercial here: <http://vimeo.com/57152507>

⁷³ Not only are the formulas/equations used here not taking one language and making them into another (by taking into account definitions, subjects and predicates, other rules of grammar, etc - in other words, no "grammar code" or something like this has even begun to be cracked...), but they are also not working on their own - rather, they are querying millions of documents where we have the original and the translation, finding ones that have similar keywords, and then looking for similar phrases and mashing them up (at least this is how I understand it).

Lanier's wider point is that here there are many, many people who are behind this curtain... and those who did that translation work that certainly has some value are not being compensated at all for what they did - and that this is more or less the same story with all these Siren servers, as he calls them.

One can readily imagine that for those in the field of artificial intelligence, it would be tempting to make it seem like this "machine translation", is more or less independent and able to do what it does by understanding "how the language works"

One of my linguist friends, retired University of Chicago librarian David Bade, notes a very interesting development in the field of linguistics:

"Language is a natural system to be studied as an object of natural science: this is the assumption that oriented linguistics in the 19th century as it did during the 20th century and continues to do so today. Ironically Chomsky's desire to develop a "hard science" of linguistics has been strenuously defended in a recent textbook which declares grammar to be "magic": "syntax has a biological base, and that human beings, from whatever language community, sociocultural background, or millennium, are all bound together by the same basic grammatical magic". Hall, Christopher J. 2005. *An Introduction to Language and Linguistics: Breaking the Language Spell*. [United States]: Bloomsbury Academic, p. 197.

So is linguistics science or magic? Evidently, one can ask the same question of things like "artificial intelligence" or any technology for that matter. As Brynjolfsson and McAfee quote Arthur C. Clarke in their recent book the Second Machine Age: "Any sufficiently advanced technology is indistinguishable from magic." Brynjolfsson, Erik. 2014. *Second Machine Age: Work, Progress, and Prosperity in the Time of Brilliant Technologies*. [S.I.]: W W Norton, p. 13.

⁷⁴ I would even go so far myself to say that not only are we not a gadget (Lanier), but the gadgets will never even approximate us.

⁷⁵ Steven Bell, "Promise and Problems of Big Data," *From the Bell Tower* (blog), March 13, 2013, <http://lj.libraryjournal.com/2013/03/opinion/steven-bell/promise-and-problems-of-big-data-from-the-bell-tower/>.

⁷⁶ OCLC. (Producer). (2014). Hope and Hype of MOOCs [webinar]. *OCLC Americas Member Meeting and Symposium*. Retrieved from http://www.oclc.org/en-US/events/2014/ARCMetingSymposium_ALAMW2014.html
Among other fascinating items brought to the fore were that: MOOCs, being free have many people wondering what we are paying for in education ; prestigious universities want to admit few but reach many via MOOCs (something they are proud of doing) ; a social environment was necessary as well as the presence of social media ; the currently narrow adoption by faculties and students ; doing education online could allow for a one-to-one relationship with a teacher, something noted by Isaac Asimov in the 1980s ; self-motivated students and persons who are already educated are the ones taking MOOCs ; most MOOCs are using old fashioned technology and techniques and not doing much that is innovative ; MOOCs might become MOCs (pay-to-play) ; higher education might need to "disrupt itself" in order to remain viable. My own sense is that we really do need to have personal connections (even beyond what cMOOCs) to determine real capabilities of learner (this is present at least to some degree in many universities that are respected for their online learning programs). Higher ed. does not want to graduate incompetent persons they can't be sure have been appropriately vetted / tested. In other words, these three c's are important: credentials, competency, and connections (meaning personal vetting by teachers). Evidently a real need. See: <http://www.smithsonianmag.com/science-nature/the-vast-majority-of-raw-data-from-old-scientific-studies-may-now-be-missing-180948067/>

⁷⁷ Evidently a real need. See: <http://www.smithsonianmag.com/science-nature/the-vast-majority-of-raw-data-from-old-scientific-studies-may-now-be-missing-180948067/>

⁷⁸ Comment From Carol Feltes: @Chris Cole, 2:23, quoted in OCLC. (Producer). (2014). Driven by Shared Data [Chat webcast]. In *Collective Insight*. Retrieved from <http://oclc.org/en-US/events/collective-insight.html> : "tell me about it. NIH submission has been a nightmare. Scientists do not see this as an appropriate activity for themselves. Once they have published, they have little interest in maintaining the data, or slogging through the NIH submission process. in spite of the law. Yes it great that big funders may dictate some sort of compliance, but the research community's interest is not there, and they need help. And once they are done with data, someone else needs to oversee it's curation. There is a lot behind a paper that does not go to the NIH, or any other, mandated repository."

It is easy to see why scientists may not want to do this when one reads the account of environmental scientists doing a long-term data collection project on rivers in Maryland. See David Ribes and Steven J. Jackson's account of this in the chapter "Data Bite Man", Gitelman, Lisa. 2013. *"Raw Data" is an Oxymoron*. Cambridge, Massachusetts: MIT Press, pp. 162-165.

⁷⁹ Comment From Carol Feltes at 2:46, *ibid*.

⁸⁰ Done via Schema.org, which makes library interoperable with commercial organizations.

⁸¹ OCLCVideo. 2013. "Alistair Croll: Implications and Opportunities of Big Data." YouTube video, March 13. http://www.youtube.com/watch?v=lc_BIPesEls.

⁸² Lanier, Jaron. "Fixing the Digital Economy." *New York Times*, Jun 09, 2013, Late Edition (East Coast). More from his book: "Automation can always be understood as elaborate puppetry....It turns out... that big data coming from

vast numbers of people is needed to make machines appear to be 'automated.' Do the puppeteers still get paid once the whole audience has joined their ranks?" *Who Owns the Future?* New York: Simon & Schuster.,. 123-124.

⁸³ See Cumbley, R., and P. Church. 2013. "Is 'Big Data' Creepy?" *The Computer Law and Security Report*. 29 (5): 601-609: "Whilst the mere collection of this information can be intrusive, the privacy risks are multiplied when multiple pools of data are combined. However, data combination is one of the central aims of Big Data analysis. It creates valuable datasets, even when purportedly anonymized... One prominent example is Google.... A footnote says "See, for the example, the analysis of data about users of *Everything Everywhere's* network by Ipsos Mori as discussed in Switch on and you become a goldmine, Richard Kerbaj and Jon Ungood-Thomas, *The Sunday Times*, 12 May 2013 and Ipsos MORI's response on 12 May 2013, <http://www.ipsos-mori.com/newsevents/latestnews/1390/Ipsos-MORI-response-to-the-Sunday-Times.aspx>"

⁸⁴ See <http://www.businessinsider.com/advertisers-using-facial-recognition-technology-2013-5?op=1>.

⁸⁵ See Cumbley, R., and P. Church. 2013. "Is 'Big Data' Creepy?" *The Computer Law and Security Report*. 29 (5): 601-609 and for information on the NSA see <https://firstlook.org/theintercept/2014/02/24/jtrig-manipulation/> Interestingly, this is an issue that unites persons of different political extremities. Lanier notes that the public library is the last place you can learn without being watched, without your data being aggregated. "There's a remarkable thing about the public library," he said. "If you go to the public library to learn about something, and you do it with paper books, it's the only instance in which you can learn in our society today...[where] you aren't under observation." "Jaron Lanier on Big Data". 2013. *Library Journal –New York*. 138 (19): 18.

⁸⁶ For a nice example of this see Schumacher, E. F. 1977. *A Guide for the Perplexed*. New York: Harper & Row, p. 121. "Various solutions are offered which gradually and increasingly converge until, finally, a design emerges which is 'the answer' – a bicycle – an answer that turns out to be amazingly stable over time... because it complies with the laws of the Universe – laws at the level of inanimate nature."

⁸⁷ *Ibid*, p. 127. More excellent, and I would say very ethical, observations from p. 5 and 125: "What we have to deplore... is not so much the fact that scientists are specialising, but rather the fact that specialists are generalizing.... Convergent problems relate to...where manipulation can proceed without hindrance and where man can make himself 'master and possessor,' because the subtle, higher forces – which we have labeled life, consciousness, and self-awareness – are not present to complicate matters. Wherever these higher forces intervene to a significant extent, the problem ceases to be convergent".

⁸⁸ The New York Public Library. 2013. "Jaron Lanier | LIVE from the NYPL." YouTube video, October 10. <https://www.youtube.com/watch?v=aFW9qxKojrE>.

⁸⁹ Cukier, K., and V. Mayer-Schoenberger. 2013. "The Rise of Big Data How It's Changing the Way We Think About the World". *Foreign Affairs – New York*. 92 (3): 28-40, p. 39 and 40.

⁹⁰ Barclay, Paul. 2013. Jaron Lanier: Reconstructing the Digital Economy. Big Ideas. podcast radio program. Sydney: ABC Radio National, July 10. <http://www.abc.net.au/radionational/programs/philosopherszone/minds-and-computers/3290844>

⁹¹ Schumacher, E. F. 1977. *A Guide for the Perplexed*. New York: Harper & Row, 207.

⁹² OCLCVideo. 2013. "Alistair Croll: Implications and Opportunities of Big Data." YouTube video, March 13. http://www.youtube.com/watch?v=lc_BIPesEls.

⁹³ I simply cite his ethical point. How this could be done is another issue, and some have strenuously argued that Lanier's prescription for the solution is untenable and unworkable. I wish I could disagree with them.

⁹⁴ Again, Lanier constantly notes "the persons behind the curtain". As regards machine translation, AI in the classic sense does not work, but big data does work - but big data is just people in disguise. Lanier notes that we can't unlock the "formulas" to translate like Einstein did for space and time. Therefore, the only question is whether or not we acknowledge the amount of value that persons put into the econ or not. Otherwise, wealth and power will continue to be concentrated around those with biggest computers.

⁹⁵ More complete picture (from my notes): We have decided that the only business plan that's viable in the information space – because we believe information should be free – is to use behavior models of people or behavior models of the world to manipulate the world....that's a much better description of what companies like Google and Facebook sell than the term advertising.... Manipulating the options in front of you is not like advertising – it is not a communications act – it's a subtle manipulation of what steps are put in front of you.

⁹⁶ Notes from Davis, Kord, and Doug Patterson. 2012. *Ethics of Big Data*. Sebastopol, CA: O'Reilly: (p. 16): identity (Christopher Pool says multifaceted, Zuckerberg says having more than one demonstrates a "lack of integrity"), privacy (funny 1993 New Yorker cartoon: "no one knows you're a dog on the internet" "what right do others have to make [information about one's identity] public?..." "Can the creation of data about ourselves be considered a creative act? Does our mere existence constitute a creative act? If so, then do not all the legal protections associated with copyright law naturally follow?" [17] "Why do we expect the ability to self-select and control which facets we share with the world online to be the same as it is offline?" [18]), reputation (ability to manage this online is growing farther and farther out of individual control [18]) and ownership ("do we, in the offline world 'own' the facts about our height and weight?", does info about us or what we can do "constitute property that we own? Is there any distinction between the ownership qualities of that information?" "As open data markets grow in size and complexity, open government data becomes increasingly abundant, and companies generate more revenue from the use of personal data, the question of who owns what – and at what point in the data trail – will become a more vocal debate" [19].

⁹⁷ Fate has always been a way of avoiding personal responsibility, but perhaps it can now be supercharged with technology.

⁹⁸ Lanier also notes that "YouTube doesn't take responsibility for checking if a video, before it's uploaded, violates a copyright. Facebook isn't culpable if a tormented teenager is driven to suicide." Lanier, Jaron. "Fixing the Digital Economy." *New York Times*, Jun 09, 2013, Late Edition (East Coast).

⁹⁹ I admit that I fight being cynical about the world, even as I, for religious reasons, have great hope. In a world increasingly focused on the efficient acquisition of commodities to meet our desires, all are expected to prove their worth, and perhaps, in some cases, their case for continuing to be able to exist, presuming that their lives are not ended early on. Real love, as opposed to a "love" rooted only in feelings of what the other does for us, has left the building.

The new Pope has some very insightful words here as well, it seems:

The joy of living frequently fades, lack of respect for others and violence are on the rise, and inequality is increasingly evident. It is a struggle to live and, often, to live with precious little dignity. This epochal change has

been set in motion by the enormous qualitative, quantitative, rapid and cumulative advances occurring in the sciences and in technology, and by their instant application in different areas of nature and of life. We are in an age of knowledge and information, which has led to new and often anonymous kinds of power. (p. 45)...

Human beings are themselves considered consumer goods to be used and then discarded. We have created a “throw away” culture which is now spreading. It is no longer simply about exploitation and oppression, but something new. Exclusion ultimately has to do with what it means to be a part of the society in which we live; those excluded are no longer society’s underside or its fringes or its disenfranchised – they are no longer even a part of it. The excluded are not the “exploited” but the outcast, the “leftovers”. (p. 46)

“We have created new idols. The worship of the ancient golden calf (cf. Ex 32:1-35) has returned in a new and ruthless guise in the idolatry of money and the dictatorship of an impersonal economy lacking a truly human purpose. The worldwide crisis affecting finance and the economy lays bare their imbalances and, above all, their lack of real concern for human beings; man is reduced to one of his needs alone: consumption.” (p. 47)

“In the prevailing culture, priority is given to the outward, the immediate, the visible, the quick, the superficial and the provisional. What is real gives way to appearances. In many countries globalization has meant a hastened deterioration of their own cultural roots and the invasion of ways of thinking and acting proper to other cultures which are economically advanced but ethically debilitated.”

Catholic Church. 2013. *The joy of the gospel = Evangelii gaudium : Apostolic Exhortation*, accessed November 2013, <http://www.vatican.va/evangelii-gaudium/en/files/assets/basic-html/page46.html>

¹⁰⁰ See <http://well.blogs.nytimes.com/2014/03/10/parents-wired-to-distraction/>

¹⁰¹ I think that it is not wrong to talk about “externalizing knowledge” per se, even as I think it is better to talk about “knowledge” that does not reside in actual human beings as information, simply in order to highlight the importance of the personal aspect (here, see Michael Polanyi’s *Personal Knowledge*). The question simply revolves around what we want to make sure remains in our “working memories” as well. Along these lines, E.F. Schumacher offers some general observations about this kind of internal “mapmaking” that seem to me most helpful:

Mapmaking is an empirical art that employs a high degree of abstraction but nonetheless clings to reality with something akin to self-abandonment. Its motto, in a sense, is “Accept everything: reject nothing.” If something is there, if it has any kind of existence, if people notice it and are interested in it, it must be indicated on the map, in its proper place.....What is the value of a description if it omits the most interesting aspects and features of the object being described?

Schumacher, E. F. 1977. *A Guide for the Perplexed*. New York: Harper & Row, 7, 118.

Is all “pattern recognition” valid? Is it reasonable to think that we can creatively “synthesize information” any way we intuit? I submit that reality not infinitely malleable, i.e., “it can’t be carved up just any way” as David Weinberger said a few years ago. The University of Chicago sociologist Andrew Abbot shares the interesting observation, that [even] in library-based work [historians, English literature, etc], there is “a taste for reinterpretation that is clever and insightful but at the same time founded in evidence and argument.” If we go with Schumacher’s map-making analogy above, it becomes clear that we human beings need very complex maps, because as Abbot says: “Meaning has an extraordinary multiplicity that cannot be easily captured by the rigidly

limited vocabularies of variables and standard methods". Quotes from Andrew Abbot, "The Traditional Future: A Computational Theory of Library Research" [pre-print], eventually published in *College & Research Libraries* vol. 69 no. 6, November 2008, pp. 524-545

¹⁰² Carr, Nicholas, "All Can Be Lost: the Risk of Putting All Our Knowledge in the Hands of Machines," *The Atlantic*, November, <http://www.theatlantic.com/magazine/archive/2013/11/the-great-forgetting/309516/>. Carr starts out the article talking about how pilots have had difficulty working with automatic pilot in some situations – unaccustomed to flying the plane themselves, when the automatic pilot has failed, this has recently led to some major crashes. Perhaps this bit from the article is preview of his upcoming book, *The Glass Cage*: The first automatic pilot, dubbed a "metal airman" in a 1930 Popular Science article, consisted of two gyroscopes, one mounted horizontally, the other vertically, that were connected to a plane's controls and powered by a wind-driven generator behind the propeller. The horizontal gyroscope kept the wings level, while the vertical one did the steering. Modern autopilot systems bear little resemblance to that rudimentary device. Controlled by onboard computers running immensely complex software, they gather information from electronic sensors and continuously adjust a plane's attitude, speed, and bearings. Pilots today work inside what they call "glass cockpits." The old analog dials and gauges are mostly gone. They've been replaced by banks of digital displays. Automation has become so sophisticated that on a typical passenger flight, a human pilot holds the controls for a grand total of just three minutes. What pilots spend a lot of time doing is monitoring screens and keying in data. They've become, it's not much of an exaggeration to say, computer operators...." For more on the difficulties encountered with the automation of fighter jet cockpits, see Bade, David. 2012. "IT, That Obscure Object of Desire: On French Anthropology, Museum Visitors, Airplane Cockpits, RDA, and the Next Generation Catalog". *Cataloging & Classification Quarterly*. 50 (4): 316-334.

¹⁰³ Miller, Matt. 2013. Thought-Controlled Computing. *This...Is Interesting*. podcast radio program. Santa Monica: KCRW News, July 31. http://www.kcrw.com/news/programs/in/in130731thought-controlled_c (with guest Ariel Garten)

¹⁰⁴ Carr: "I don't have a microchip in my head – yet," says the man charged with transforming Google's relations with the technology giant's human users. But Scott Huffman does envisage a world in which Google microphones, embedded in the ceiling, listen to our conversations and interject verbal answers to whatever inquiry is posed.

Ceilings with ears. A dream come true.

It's clear now that Google and Microsoft have to bury the hatchet, if only to collaborate on a system combining the Microsoft Nudge Bra with the Google Ambient Nag. So when the Nudge Bra picks up a stress-related eating urge, the Ambient Nag will be able to say something like, "Do you really want those Twizzlers?"

The voice from the ceiling is only the beginning. Eventually, Huffman suggests, the Ambient Nag will become indistinguishable from the voice of your conscience:

Google believes it can ultimately fulfil people's data needs by sending results directly to microchips implanted into its user's brains. ... "If you think hard enough about certain words they can be picked up by sensors fairly easily. It'll be interesting to see how that develops," Mr Huffman said.

Nicholas Carr, "Voice From Above," *Rough Type* (blog), December 12, 2013, 4:01 PM, <http://www.roughtype.com/?p=4095>.

¹⁰⁵ Miller, Matt. 2013. Thought-Controlled Computing. *This...Is Interesting*. podcast radio program. Santa Monica: KCRW News, July 31. http://www.kcrw.com/news/programs/in/in130731thought-controlled_c (with guest Ariel Garten)

¹⁰⁶ Quoted by Barrat, James. 2013. *Our Final Invention: Artificial Intelligence and the End of the Human Era*. New York : Thomas Dunne Books, p. 210. Again, I do not believe that real AI is possible, but we certainly can use machines more than we ought and in ways we ought not.

¹⁰⁷ OCLCVideo. 2013. "Alistair Croll: Implications and Opportunities of Big Data." YouTube video, March 13. http://www.youtube.com/watch?v=lc_BIPesEIs. For more on how our views of computers have changed over the years see Atkinson, Paul. 2010. *Computer*. London: Reaktion Books, pp. 201-231.

¹⁰⁸ Keen, Andrew. 2011. MIT Professor Says Robotic Moment Has Arrived, and We are Toast. *Keen On*. television program. Silicon Valley: Tech Crunch TCTV, February 14. <http://techcrunch.com/2011/02/14/keen-on-sherry-turkle-tctv/> ; Keen also refers to this article: http://www.huffingtonpost.com/2010/01/10/roxxxy-sex-robot-photo-wo_n_417976.html

¹⁰⁹ Miller, Matt. 2013. Thought-Controlled Computing. *This...Is Interesting*. podcast radio program. Santa Monica: KCRW News, July 31. http://www.kcrw.com/news/programs/in/in130731thought-controlled_c (with guest Ariel Garten)

¹¹⁰ I am not talking about dating and relationship matching sites. That said, Lanier has some really interesting comments about that as well: "technological solutions not embraced by Silicon Valley: For all the extolling of AI and the like, Apple would not leave the design choices for its products on an algorithm instead of Steve Jobs.... Lanier: has to do with the 'nerd supremacy' problem – people are being encouraged to leave to algorithms pretty person decisions – what music we listen to, who we date, what movies we see, etc.... Silicon Valley 'knows that these algorithms don't do anything'... 'we aren't going to believe that crap'..... 'we don't live by them ourselves, and so that is something worth noticing'." Miller, Matt. 2013. Will Google and Facebook Destroy the Middle Class? *This...Is Interesting*. podcast radio program. Santa Monica: KCRW News, Jun 5. http://www.kcrw.com/news/programs/lr/lr130605will_google_and_face

¹¹¹ Lanier, Jaron. "Fixing the Digital Economy." *New York Times*, Jun 09, 2013, Late Edition (East Coast).

¹¹² "An old-fashioned exercise in power, like censoring social network expression, would reduce the new kind of power, which is to be a private spying service on people who use social networking." *Ibid*.

¹¹³ And again, where is this going in the relative short-term? Lanier says the following: "Siren Servers drive apart our identities as consumers and workers. In some cases, causality is apparent: free music downloads are great but throw musicians out of work. Free college courses are all the fad, but tenured professorships are disappearing. Free news proliferates, but money for investigative and foreign reporting is drying up. One can easily see this trend extending to the industries of the future, like 3-D printing and renewable energy." *Ibid*.

¹¹⁴ The New York Public Library. 2013. "Jaron Lanier | LIVE from the NYPL." YouTube video, October 10. <https://www.youtube.com/watch?v=aFW9qxKojrE>. Lanier connects all of this to social status concerns due to evolution. It seem to me that here we have "coercion by the machine – the seduction machine that carries us away (no autonomy). This is more akin to *Brave New World* than *1984*. This notion of seduction seems doubly powerful to me when one consider the crazy fact that most of the technical advances that are developed on the internet are pioneered by persons involved in the pornography industry.

What happens here, it seems to me, is that this “hard truth” of everything being mechanical, is balanced with softer, more humanistic notions, more so I think in the latter than the former, and yet, the “hard truth” put forth here has a unrelenting power it seems, to pull us towards itself and into itself to drive our thinking and conversation.

It seems to me akin to the old notion of fate, updated with all of our scientific knowledge...and minus some classical virtues even.

¹¹⁵ John Bunyan, quoted in Lewis, C. S. 1996. *The Abolition of Man, or, Reflections on Education with Special Reference to the Teaching of English in the Upper Forms of Schools*. New York: Simon & Schuster, p. 63.

¹¹⁶ Of course, then there is also the fact that they no longer lived in a society where having more than a couple children was honored.

¹¹⁷ Capitalism has also always encouraged us to give business to those who offer the lowest price – and can still be trusted – but now, even here, the idea that it makes sense to support local businesses – people you know and you know what they are doing – is even further drowned out.

¹¹⁸ Brynjolfsson, Erik. 2014. *Second Machine Age: Work, Progress, and Prosperity in the Time of Brilliant Technologies*. [S.I.]: W W Norton, p. 249.

¹¹⁹ Again, historically it has not been uncommon to see the universe, or cosmos, as a machine – early on in the days leading up to modern science as a clock and later on as an automaton. See Cohen, John. 1967. *Human Robots in Myth and Science*. South Brunswick [N.J.]: A.S. Barnes, pp. 76-78. Nowadays, it is not uncommon to hear serious physicists talking about the possibility of the universe being a computer, or a quantum computer, or a computer program. The transhumanist (note that Nick Bostrom is a professor of philosophy at Oxford University and is the chairman of the World Transhumanist Association) Hans Moravec believes that the whole of our reality is a simulation created by machine intelligences from the future. In the introduction to the book *Is God a Mathematician?* by Larson Lavio he talks about how the fastest way to get rid of most pesky persons who want to share their theory of the universe with him is to tell them that they need to be able to express it mathematically, because no theory of the universe is worth anything unless this can be done. It is said in jest, but there is much more to that I think. The mechanical and mathematical seem to go hand in hand to me.

¹²⁰ Barclay, Paul. 2013. *Morals and the Machine*. *Big Ideas*. podcast radio program. Sydney: ABC Radio National, October 3. <http://www.abc.net.au/radionational/programs/bigideas/morals-and-the-machine/4881302>.

¹²¹ Professor Gordon Wyeth, Head of School Science and Engineering, Queensland University of Technology.

¹²² Barclay, Paul. 2013. *Morals and the Machine*. *Big Ideas*. podcast radio program. Sydney: ABC Radio National, October 3. <http://www.abc.net.au/radionational/programs/bigideas/morals-and-the-machine/4881302>.

Hence the famous Turing test, a test in which those who participate discern whether or not they are dealing with a robot or another human being by taking part in a simple conversation by exchanging messages back and forth.

¹²³ This can simply be summed up as imperfect models not representing the world well – or as well as the context demands that you should know it – but forced on it nonetheless. Google made some big claims not long ago saying that it could trace flu outbreaks with the big data that it had, but was humbled later on when they weren’t able to do it in real-time. A man named Dr. Hansen said the problem was “data without context” and summed the

situation up with a quote from the playwright Eugène Ionesco: “Of course, not everything is unsayable in words, only the living truth.” <http://bits.blogs.nytimes.com/2013/02/24/disruptions-google-flu-trends-shows-problems-of-big-data-without-context/>

I understand the power behind Ionesco’s critique and yet, as a Christian, my view of words is that they are meant to be living and active, life-giving and life-forming. Even when put on paper for safeguarding - perhaps then especially so. For I believe there is nothing less than human about the “technology” of writing. After all, one might memorize the love poems of the beloved, or even better, the Beloved. Yes, [living] context is key.

¹²⁴ The New York Public Library. 2013. "Jaron Lanier | LIVE from the NYPL." YouTube video, October 10. <https://www.youtube.com/watch?v=aFW9qxKojrE>.

¹²⁵ “What is most unfortunate about this development is that the data body not only claims to have ontological privilege, but actually has it. What your data body says about you is more real than what you say about yourself. The data body is the body by which you are judged in society, and the body which dictates your status in the world. What we are witnessing at this point in time is the triumph of representation.” (Critical Art Ensemble, *The Electronic Disturbance*, 1993 ; quoted in Gitelman, Lisa. 2013. “Raw data” is an oxymoron. Cambridge, Massachusetts: MIT Press, p. 121.

¹²⁶ Are computers just not able to love perhaps because they do not have bodies – i.e. that they do not have an “embodied mind” – or is there something else that separates us from them? See <http://www.abc.net.au/radionational/programs/philosopherszone/minds-and-computers/3290844>

¹²⁷ If this sounds cryptic, read this short blog post by Phil Simon about “Big Data Lessons From Netflix”: <http://www.wired.com/insights/2014/03/big-data-lessons-netflix/> In short, Netflix knows what kinds of colors are likely to get your attention in the movie and TV series posters they show you.

¹²⁸ We can add the word “ontology” as well.

¹²⁹ One might hope that when it comes to any technological development we would first focus on coming to deeply know and love the world – and to find the best ways to work with it to the mutual benefit of all. In other words, that we would exist in an environment where any technological development is slow, flexible, and constrained. “Permaculture” is a good metaphor here. More often than not however, it seems that we must operate in an environment where technological development cannot be slow. It cannot be flexible. It cannot be constrained.

¹³⁰ In an email message to the author from November 2013 from now retired University of Chicago librarian David Bade he commented: “If we reorient our understanding of knowledge to be what the lover alone knows of the beloved, and that precisely because that knowledge is freely and joyfully shared, knowledge as power is seen to be the lie that it is.” Compare this to Lord Kelvin: “When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind.” (quoted on p. 57 Brynjolfsson, Erik. 2014. *Second Machine Age: Work, Progress, and Prosperity in the Time of Brilliant Technologies*. [S.l.]: W W Norton) Also note that if such scientism is a god of this age, it is eros, not phileo or agape (that is, that love which Bade spoke of above), that is another. See the highly insightful essay by philosopher Simon May “The irresistible appeal of the romantic ideal”, in this *Financial Times* article: <http://www.ft.com/intl/cms/s/0/bf810484-9255-11e3-8018-00144feab7de.html#axzz2w38ZEGCe> ;

also this fascinating piece featuring a letter from J.R.R. Tolkien to his 21 year old son:
<http://www.albertmohler.com/2014/03/11/from-father-to-son-j-r-r-tolkien-on-sex/>

¹³¹ Even seemingly more humanistic endeavors might seem to occasionally fall prey to language that, in effect, makes human beings and data about human beings equals : "Ribes and Jackson [chapter 8] show the surprising complexities in something as apparently simple as collecting water samples from streams, while they challenge readers to think of scientists and their data as evolved and evolving symbionts, mutually dependent species adapted amid systems ecological and epistemic". Gitelman, Lisa. 2013. *"Raw data" is an Oxymoron*. Cambridge, Massachusetts: MIT Press, p. 11 (introduction).

In a world where big data increasingly seems to rule I wonder if this kind of language helps...

¹³² It seems to me that many of us are like fish in the fish tank where all we know is "what works" and "useful fictions".

¹³³ In other words, to say that the pragmatic approaches that we are discussing here are shortsighted is the least of our problems. Fundamentally, it seems to me that there is a crisis here in belief regarding any true knowledge.

Any real ontology (what is, period) and teleology are gone and even epistemology (the mind's apprehension of reality... an analysis of the contents of consciousness... not what is but what is known and how), perhaps kept alive in a post-Christian age by movements like romanticism and historicism, has been eclipsed by a more or less pure and perpetually skeptical naturalism – which means we are left only with the pragmatism that must accompany this naturalism en route to our increasingly unreflective pursuits of happiness (and a little bit of social justice to of course).

¹³⁴ Miller, Matt. 2013. Will Google and Facebook Destroy the Middle Class? *This...Is Interesting*. podcast radio program. Santa Monica: KCRW News, Jun 5.
http://www.kcrw.com/news/programs/lr/lr130605will_google_and_face

Lanier makes a similar, but not identical statement in p. 196 of his new book. There he states that while he can't prove that people are special, "I can argue that it's a better bet to presume we are special, for little might be lost and much more might be gained by doing so". Lanier, Jaron. 2013. *Who owns the future?* New York: Simon & Schuster.

Here is where I must ask "how can this be enough"? It seems what is being said here is that we simply need "useful fictions" in order to survive and thrive as human beings. Lanier's wager seems to me a house of cards – not having the requisite foundation. In other words, it seems to me that Lanier has some very good and true insights, but the intellectual superstructure that can actually buttress them at a deep and satisfying level has been removed. Lanier's account – while perhaps being more compelling, personal, holistic, and "everyone has a voice"-ish than most – still seems to leave human beings in their position of being just another "a cog in the machine".

I particularly find Lanier's wager to be severely undercut by this statement from his book: "You are the reverse image of inconceivable epochs of heartbreak and cruelty. Your would-be ancestors in their many species, reaching back into the phylogenetic tree, were eaten, often by disease, or sexually rejected before they could contribute genes to your legacy. The genetic, natural part of you is the sum of the leftovers of extreme violence and poverty. Modernity is precisely the way individuals arose out of the ravages of evolutionary selection." (p. 131)

Later on, he also makes this statement: “Belief in the specialness of people is a minority position in the tech world, and I would like that to change. The way we experience life – call it ‘consciousness’ – doesn’t fit in a materialistic or informational worldview. Lately I prefer to call it ‘experience,’ since the opposing philosophical team has colonized the term consciousness. That term might be used these days to refer to the self-models that can be implemented inside a robot.” (p. 195)

Lanier talks about predominant Silicon Valley forms of faith on pp. 193-195 of his book.

So some hard questions to think about: Other than getting some basic facts on the ground right to ensure survival, what is the non-transcendence-minded person’s strongest incentives (I would say Lanier seems to be a transcendence-minded person) to be as accurate as possible regarding all questions of significance persons have or care to have about what is true?

¹³⁵ *Ibid*, p. 205, This is the title of chapter 17 of his book.

¹³⁶ Note that “the German philosopher Martin Heidegger developed the theory that technology, as it gradually comes to dominate our world, forces us to see the world in a defined way; a world view in which everything must necessarily be seen as a means to an end and where it is not possible to see anything as valuable in itself... This is in line with the German sociologist Max Weber’s view of development during industrialization. Here he speaks about more and more areas, beginning with working life, but with increasing ripples out to the ‘social’ work’, being dominated by a rational logic that stems from technology.” Danish Council of Ethics, “Technology in Human Development,” *The Danish Council of Ethics*, last date of modification not listed, <http://www.etiskraad.dk/en/Temauniverser/Homo-Artefakt/Artikler/Kulturhistorie/Teknologien%20i%20menneskets%20udvikling.aspx>, accessed Mar. 13, 2014. I have heard about and listened to lectures on both of these men, but have not read any of their works. I am not aware of whether or not they used the same arguments that I have used to arrive at their conclusions. In any case, I note that in spite of the power of Heidegger’s critique, there really is nothing positive – not to mention firm and confidence-inducing – that he has to put in its place. One wonders whether or not that could explain why a man like Heidegger – widely recognized as one of the most influential and brilliant philosophers of the 20th c. – ended up throwing in his lot with the Nazis, a fact that has only come to light in recent years.

¹³⁷ Miller, Matt. 2013. *Will Google and Facebook Destroy the Middle Class?* This...Is Interesting. podcast radio program. Santa Monica: KCRW News, Jun 5. http://www.kcrw.com/news/programs/lr/lr130605will_google_and_face (with guest Jaron Lanier)

¹³⁸ To consider human beings no differently than animals seems to me an extreme position to take. Even radical environmentalists in effect treat human beings as special because they believe we are uniquely responsible to for being responsible stewards of the world. In any case, perhaps one looks closely at the practices of various kinds of factory farming, such an extreme position becomes, at the very least, more understandable.

¹³⁹ See the works of the highly regarded and respected Princeton ethicist Peter Singer.

¹⁴⁰ Serious technologists talk about robots having rights. In the Robotronica conference mentioned above, most all of the panelists talked about how we must be forward thinking about this from a legal point of view. Yes, there were those who simply talked about this from a legal perspective: one noted that for liability reasons ships and companies are defined as legal persons and another pointed out that we have laws that protect companion animals for sake of owners (because they are attached to them) and therefore should also have that for

companion robots. And yet another panelists argued that insofar as robots have the potential to be like human beings, they should be afforded that kind of status. We should think about them as a new kind of species. Barclay, Paul. 2013. *Morals and the Machine. Big Ideas*. podcast radio program. Sydney: ABC Radio National, October 3. <http://www.abc.net.au/radionational/programs/bigideas/morals-and-the-machine/4881302>.

¹⁴¹ “In posthumanism, the association of humanity with a “natural” (unenhanced) mind and body is reduced to an ‘accidental’ ‘biological substrate.’ Elsewhere, Hayles argues that be viewing the human as an existence without essence, ‘as a pattern rather than a presence,’ the body can be disposed of, and the mind uploaded to a database; the body, replaced with a cybernetic prosthesis; the mind, enhanced and ‘improved’ using computer software. The line that separates humans and machine, mind and computer is dissolved, and can become anything the designer wishes it to be.” Justin Everet, “The Borg as Vampire in Star Trek”, in Browning, John Edgar, and Caroline Joan Picart. 2009. *Draculas, vampires, and other undead forms: essays on gender, race, and culture*. Lanham, Md: Scarecrow Press, 79. For more on transhumanism, see this excellent web article from the Danish Council of Ethics: <http://www.etiskraad.dk/Temauniverser/Homo-Artefakt/Artikler/Kulturhistorie/Transhumanisme.aspx>

¹⁴² Here is where I can only point to something outside of ourselves: transcendence, and particularly the Christian faith centered on the grace of God (I suggest a good study bible, and you can read my blog, theology like a child, for more from me – or feel free contact me using the “about” page there). At the very least, I am sure that many would agree that we should be curious about the nature of being and consciousness!

Here’s a start in that direction:

In the dawn of life we sense with a perfect immediacy, which we have no capacity or inclination to translate into any objective concept, how miraculous it is that—as Angelius Silesius (1624-1677) says—“Die Rose ist ohne warum, sie blühet, weil sie blühet”: “The rose is without ‘why’; it blooms because it blooms.” As we age, however, we lose our sense of the intimate otherness of things; we allow habit to displace awe, inevitability to banish delight; we grow into adulthood and put away childish things. Thereafter, there are only fleeting instants scattered throughout our lives when all at once, our defense momentarily relaxed, we find ourselves brought to a pause by a sudden unanticipated sense of the utter uncanniness of the reality we inhabit, the startling fortuity and strangeness of everything familiar: how odd it is, and how unfathomable, that anything at all exists; how disconcerting that the world and one’s consciousness of it are simply there, joined in a single ineffable event. ... One realizes that everything about the world that seems so unexceptional and drearily predictable is in fact charged with an immense and imponderable mystery. In that instant one is aware, even if the precise formulation eludes one, that everything one knows exists in an irreducibly gratuitous way: “what it is” has no logical connection with the reality “that it is”; nothing within experience has any “right” to be, any power to give itself existence, any apparent “why.” The world is unable to provide any account of its own actuality, and yet there it is all the same. In that instant one recalls that one’s every encounter with the world has always been an encounter with an enigma that no merely physical explanation can resolve. Hart, David Bentley. 2013. *The experience of God: being, consciousness, bliss*. New Haven, Yale University Press, pp. 88-89.

This sounds rather intelligent, reasonable and erudite, does it not? And yet, nowadays it seems to me that it is becoming ever more fashionable to speak as Charles Blow does in this New York Times op-ed:

“I don’t personally have a problem with religious faith, even in the extreme, as long as it doesn’t supersede science and it’s not used to impose outdated mores on others.”

He goes on: "But some people see our extreme religiosity itself as a form of dysfunction. In a 2009 paper in the journal *Evolutionary Psychology*, Gregory Paul, an independent researcher, put it this way: "The level of relative and absolute societal pathology in the United States is often so severe that it is repeatedly an outlier that strongly reinforces the correlation between high levels of poor societal conditions and popular religiosity." Charles M. Blow, "Indoctrinating Religious Warriors," *The New York Times*, January 3, 2014, accessed Mar. 14, 2014, http://www.nytimes.com/2014/01/04/opinion/blow-indoctrinating-religious-warriors.html?ref=charlesmblow&_r=1

¹⁴³ There are many who hold to sincere materialist / reductionist positions, and even for many who don't believe this – or perhaps hold to these beliefs lightly (keeping it as one of their spheres of knowledge that may or may not overlap that much with the others) – it is easy to act like a "functional" reductionist. What I mean is that we start functioning largely with a view to assert ourselves over and against all those we must deal with because we feel we can't trust them to be all that concerned about us – even if we don't believe that life's fundamental essence can be reduced to the smallest individual particles physics is able to discern.

FDR said, "No country, however rich, can afford the waste of its human resources. Demoralization caused by vast unemployment is our greatest extravagance. Morally, it is the greatest menace to our social order", quoted in Brynjolfsson, Erik, and Andrew McAfee. 2012. *Race Against the Machine: How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy*. Lexington, Mass: Digital Frontier Press, p. 65. I would say that there is an even greater menace that but a few realize and take seriously – even as all manner of social science can be drawn upon to support this assertion. That is that having strong natural families – nuclear or extended – is absolutely critical to having a healthy society. Christianity has bequeathed to us an understanding of the individual as having an infinite value, and yet the Enlightenment, stealing from Christianity, made the individual important in its own way, and it seems clear to me the natural family has been dissolved largely in the light of this Enlightenment acid. The individual replaces the family as the fundamental unit of social organization, and society cannot ultimately bear such atomization.

¹⁴⁴ Brooks, David. "What Machines can't do." *New York Times*, Feb 04, 2014, Late Edition (East Coast). The full quote about essentialists is this: "essentialists will probably be rewarded. Any child can say, "I'm a dog" and pretend to be a dog. Computers struggle to come up with the essence of "I" and the essence of "dog," and they really struggle with coming up with what parts of "I-ness" and "dog-ness" should be usefully blended if you want to pretend to be a dog."

I note that Nicholas Carr talks about essence (actually substance) in his review of Andrew Keen's book, *Digital Vertigo*, cleverly noting that "substance is more important than being transparent". And yet here to, in this context, substance, or essence, does not necessarily talk about stable things that last, but rather the matter of personal integrity.

This quote from a Stanford humanist is telling: What I want to say....is that there is probably no way to end the exclusive dominance of interpretation, to abandon hermeneutics... in the humanities without using concepts that potential intellectual opponents may polemically characterize as "substantialist," that is concepts such as "substance" itself, "presence," and perhaps even "reality" and "Being". To use such concepts, however, has long been a symptom of despicably bad intellectual taste in the humanities; indeed, to believe in the possibility of referring to the world other than by meaning has become anonymous with the utmost degree of philosophical naivete – and until recently, few humanists have been courageous enough to deliberately draw such potentially devastating and embarrassing criticism upon themselves. We all know only too well that saying whatever it takes

to confute the charge of being “substantialist” is the humanities on autopilot (Gumbrecht, Hans Ulrich. 2004. *Production of presence: what meaning cannot convey*. Stanford, Calif: Stanford University Press, quoted in Armin Wenz. 2013. “Biblical Hermeneutics in a Postmodern World: Sacramental Hermeneutics versus Spiritualistic Constructivism.” *Logia* 22, no. 3: pp.?)

This is someone who is in the belly of the beast so to speak, and these seem to be his conclusions about what is necessary to counter the more pernicious and reductive aspects of what has been called the “technological imperative” (if it can be done, it will be done, should be done).

¹⁴⁵ “In his essay ‘Farewell to the Information Age,’ linguist Geoffrey Nunberg notes the shift in the nineteenth century from understanding information as the productive result of the process of being informed to a substance that could be morselized and extracted in isolated bits.” Nunberg, Geoffrey, in *The Future of the Book*, ed. Geoffrey Nunberg, Berkeley: University of California Press, 1996, 103-138, quoted in Garvey, Ellen Gruber, “Facts and FACTS : abolitionists' database innovations”, in Gitelman, Lisa. 2013. *“Raw data” is an Oxymoron*. Cambridge, Massachusetts: MIT Press, p. 91

¹⁴⁶ Can we at least agree that all people everywhere are universally endowed with at least some shared concepts: e.g. “thirsty”, “clouds”, “tears”, “sad”, “food”, “mother”, “father”, etc. – and that this has great significance for us as human beings?

¹⁴⁷ This is similar to the dilemma faced by the secular Jew, Andrew Leff, who said the following:

“I want to believe - and so do you - in a complete, transcendent, and immanent set of propositions about right and wrong, findable rules that authoritatively and unambiguously direct us how to live righteously. I also want to believe - and so do you - in no such thing, but rather that we are wholly free, not only to choose for ourselves what we ought to do, but to decide for ourselves, individually and as a species, what we ought to be. What we want, Heaven help us, is simultaneously to be perfectly ruled and perfectly free, that is, at the same time to discover the right and the good and to create it.” Leff, Arthur Allen. “Unspeakable Ethics, Unnatural Law”. *Duke Law Journal*. 1979 (6): 1229-1249, p. 1229.

And Nicholas Carr talks more about matters of essence, or nature, in a different, but perhaps related, context: “One of the advantages of embedding culture in nature, of requiring that works of reason and imagination be given physical shape, is that it imposes on artists and thinkers the rigor of form, particularly the iron constraints of a beginning and an ending, and it gives to the rest of us the aesthetic, intellectual, and psychological satisfactions of having a rounded experience, of seeing the finish line in the distance, approaching it, arriving at it. When we’re in the midst of the experience, we may not want it to end, we may dream of being launched into the deep blue air of endlessness, but the dream of endlessness is only possible, only has meaning, because of our knowledge that there is an end, even it is an arbitrary end, the film burning in the project...

The inventors and promoters of hypertext and hypermedia systems have always celebrated the way they seem to free us from the constraints of form, the way they seem to reflect the open-endedness of thought itself and of knowledge itself. Said Ted Nelson: ‘Hierarchical and sequential structures, especially popular since Gutenberg, are usually forced and artificial.’ He did not mean that as a compliment.

But even though we read ‘forced’ and ‘artificial’ as negative terms, there’s much that’s praiseworthy about the forced and the artificial. Civilization is forced and artificial. Culture is forced and artificial. Art is forced and artificial. These things don’t spring from the ground like dandelions. And isn’t one of the distinctive glories of the human

mind its ability to impose beginnings and endings on its workings, to carve stories and arguments out of the endless branching flow of thought and impression? Not all containers are jails. Imposing form on the formless may be artificial, but it's also liberating (not least for giving us walls to batter)."

Nicholas Carr, "No Exit," *Rough Type* (blog), October 29, 2012, 10:28 AM, <http://www.roughtype.com/?p=2019>.

¹⁴⁸ Phillips, Robin. 2014. "More Than Schooling: the Perils of Pragmatism in Christian Attitudes Toward the Liberal Arts". *Touchstone*, Sep, Oct 2013, accessed Mar. 2014, <http://www.touchstonemag.com/archives/article.php?id=26-05-028-f>

¹⁴⁹ When it comes to big data, Lanier sees the fundamental issue as one of honesty: we can't really be honest about what all the big data out there means when the powerful Siren servers that control that data have a vested interest in using that data for their own purposes. Barclay, Paul. 2013. Jaron Lanier: Reconstructing the Digital Economy. *Big Ideas*. podcast radio program. Sydney: ABC Radio National, July 10. <http://www.abc.net.au/radionational/programs/philosopherszone/minds-and-computers/3290844> I think that is a noteworthy point, but also think that there is something even deeper going on here as I have argued – something to be aware of, and honest about.

¹⁵⁰ Aiden, Erez, and Jean-Baptiste Michel. 2013. *Uncharted: Big Data as a Lens on Human Culture*. New York? : Riverhead Publishing., pp. 202 and 203.

¹⁵¹ "Kelly argues that technology is best understood as an emergent system subject to the natural forces underpinning all emergent systems. He argues that any technology creates benefits and costs but that the benefits typically outweigh the costs (perhaps by a small amount) leading to human progress." Roberts, Russ. 2010. *Kevin Kelly on What Technology Wants*. EconTalk. podcast radio program. Fairfax County, Virginia : George Mason University - Library of Economics and Liberty, Nov 29. http://www.econtalk.org/archives/2010/11/kelly_on techno.html

¹⁵² There is so much focus on solving our problems – and seeing technology as having a major part in this. But what if solving problems does not come so much from a STEM education and streamlined management but other sources? What about nurturing natural curiosities that people have about the world and confronting the great questions of the ages – with the greatest minds of the ages – that human beings have consistently needed to confront again and again?

In his post D.G Myers talks about how "Addison Schacht salivates to enroll in classics at the University of Chicago in Sam Munson's 2010 novel *The November Criminals*:"

I could study the major texts of Latin literature, to say nothing of higher-level philological pursuits, all the time. Do you know how much that excites me? Not having to do classes whose subjects are hugely, impossibly vague—like World History, like English... You know, to anchor them? So they don't dissolve because of their meaninglessness? I've looked through the sample [U of C] catalog. Holy fuck! Satire and the Silver Age. The Roman Novel. Love and Death: Eros and Transformation in Ovid. The Founding of Epic Meter. I salivated when I saw these names, because they indicate this whole world of knowledge from which I am excluded, and which I can win my way into, with luck and endurance.

So much of what is excluded from education today once was emphasized: classical works by Dante, Shakespeare, Milton, Austen. Much of what is offered in the liberal arts today is trendy and faddish, and not occupied with the kinds of great questions that were debated in the past.

I know, it is a different world. But .

¹⁵³ Jane Robbins, "The Ethics of MOOCs," Inside Higher Ed. March 25, 2013, accessed March 13, 2014, <http://www.insidehighered.com/blogs/sounding-board/ethics-moocs>.

¹⁵⁴ In an article on MOOCs by Kerry Wu, we read that academic librarians could collaborate with instructors and serve as embedded librarians in MOOCs. In this way they will "have direct access to students and gain interesting insights from the massive data available on learning behaviors". I understand what is being said here, but it seems to me that we are losing sight of what should be our primary focus, namely, giving each student the best liberal arts education that we are confident that they need. Wu K. 2013. "Academic libraries in the age of MOOCs". *Reference Services Review*. 41 (3): 576-587. For more on MOOCs in academic libraries see <http://www.educause.edu/ero/article/libraries-time-moocs>

¹⁵⁵ Bryan Alexander did actually say in the presentation that "MOOCs could be the downfall of western civilization". It got some laughs, but if a viable business model for MOOCs does take hold, I do wonder whether or not MOOCs will be more harmful than helpful in their overall effects. Online learning is hard work (I've taught some 12 online classes myself) and without the regular cues of a face-to-face class, it makes classes even more challenging. MOOCs, at least the larger ones (xMOOCs), would seem to exacerbate that.

¹⁵⁶ As Bryan Alexander pointed out in the OCLC symposium on MOOCs, one teacher told him that "if I publish this MOOC in the subject, 10-20 persons would not get jobs in this subject... it may be used to reduce costs...." This is certainly one worrisome factor with MOOCs as with so much that is mediated through digital technology: the superstars are rewarded and not even silver medals count for much.

Also, even as most of the problems I see are associated with xMOOCs, cMOOCs seem a bit problematic to me as well, and this mostly because of the philosophy of learning called "connectivism" that the persons creating them put forth:

"Lest you think this distinction is just an attempt to glom onto MOOC media mania to push a different educational agenda, the connectivist vision behind the cMOOC actually pre-dates the Stanford experiment (and resulting initiatives from that experiment such as Udacity, Coursera and edX) by several years.

This connectivist vision is best explained by its visionaries such as George Siemens who talks about open online learning as emphasizing "creativity, autonomy and social networked learning" or Stephen Downes whose new book on connective knowledge describes learning this way:

'Learning is the creation and removal of connections between the entities, or the adjustment of the strengths of those connections. A learning theory is, literally, a theory describing how these connections are created or adjusted.'

If this all seems somewhat abstract, simply consider a massive class which is not centered on a single expert (the professor) transferring his or her knowledge to students. Instead in a cMOOC environment the participants in the

course act as both teachers and students, sharing information and engaging in a joint teaching and learning experience through intense interaction facilitated by technology.”

Jonathan Haber, “xMOOC vs. cMOOC,” degree of freedom (blog), April 29, 2013, <http://degreeoffreedom.org/xmooc-vs-cmooc/> .

As one who teaches online classes, I would note this kind of student-student learning does indeed occur and in spades. That said, I simply have questions about what is meant by the description of connectivism. I do think the primary knowledge has to do with persons we know, and not what we know, but is that what is being said – or something else?

Interestingly, OCLC put on a webinar called “Collective Insight: Driven by Shared Data”. The blurb talked about the webinar in a way that brings to mind connectivism. How notions of “collectivism” and “connectivism” may or may not overlap here is an interesting question. Note the blurb for the webinar:

“Libraries work together to find solutions, save money, learn from each other, share resources and achieve efficiencies. The goal of the new Collective Insight series is to take this idea and extend it to broad issues that impact the work libraries do. By applying some massively collaborative thinking to issues and opportunities that libraries face today, we can deepen our collective knowledge, broaden our expertise, and discover specific actions that can be applied immediately—both at your library, and across the OCLC cooperative.... Here is the link to the following webinar: <http://www.oclc.org/en-US/events/collective-insight.html>

¹⁵⁷ Nicholas Carr gives an example of how the technological imperative can be overcome: “Some software writers take such suggestions to heart. In schools, the best instructional programs help students master a subject by encouraging attentiveness, demanding hard work, and reinforcing learned skills through repetition. Their design reflects the latest discoveries about how our brains store memories and weave them into conceptual knowledge and practical know-how. But most software applications don’t foster learning and engagement. In fact, they have the opposite effect. That’s because taking the steps necessary to promote the development and maintenance of expertise almost always entails a sacrifice of speed and productivity. Learning requires inefficiency. Businesses, which seek to maximize productivity and profit, would rarely accept such a trade-off. Individuals, too, almost always seek efficiency and convenience. We pick the program that lightens our load, not the one that makes us work harder and longer. Abstract concerns about the fate of human talent can’t compete with the allure of saving time and money.”

Carr, Nicholas, “All Can Be Lost: the Risk of Putting All Our Knowledge in the Hands of Machines,” *The Atlantic*, November, <http://www.theatlantic.com/magazine/archive/2013/11/the-great-forgetting/309516/>

In addition, an article from the Danish Council of Ethics notes how it is possible to say “no” to certain technologies, such as Denmark has done with atomic power: <http://www.etiskraad.dk/en/Temauniverser/Homo-Artefakt/Artikler/Kulturhistorie/Teknologien%20i%20menneskets%20udvikling.aspx>

¹⁵⁸ Cukier, Kenneth and Mayer-Schönberger, Viktor. 2013. *Big data: a Revolution That Will Transform How We Live, Work, and Think*. Boston: Houghton Mifflin Harcourt.

¹⁵⁹ It is hard to not to see this as crowding out further the kind of highly erudite work of historians, for example, who carefully cite their sources.... It seems to me that librarians have traditionally been very holistic as regards the

academic disciplines, with any “data points” being like footnotes. Now, I sense the data points from science being eager to take center stage in a context that feels more anemic, starved, and cold.

Note how I attributed life and agency to the data in that last sentence. Not to be overly literalistic, but I find that to be significant. And I did not mean to do that, but it is easy to do. I note that the author of the following quote does the same, even as she makes note of a paper that talks about the difficulties – some seemingly insurmountable – of careful data acquisition, curation and management, which is, by the way, not something the more business focused data analysts are concerned about:

"Ribes and Jackson [chapter 8] show the surprising complexities in something as apparently simple as collecting water samples from streams, while they challenge readers to think of scientists and their data as evolved and evolving symbionts, mutually dependent species adapted amid systems ecological and epistemic." (italics mine). Gitelman, Lisa. 2013. *"Raw data" is an Oxymoron*. Cambridge, Massachusetts: MIT Press, p. 11 (introduction).

Again, as I said above regarding this quote, “in a world where big data increasingly seems to rule I wonder if this kind of language helps...”

In any case, that there is a legitimate need for data management seems like a legitimate argument to me. And this, illustrating the problem, is quite funny: <http://www.youtube.com/watch?v=N2zK3sAtr-4&feature=youtu.be>

¹⁶⁰ Yes, we should always be willing to improve our services, based on reasonable assessment. That said, of course here there is the question of educational philosophy in general here to attend to – which applies to libraries as well. All of us know, deep down, that educators must have confidence to give the “customer” what they need even if they don’t want it. This does not mean the educator presumes he knows everything but rather that he knows something – and something important. If civilization means anything, what the “customer” needs can only be wrapped up in attractive tortillas they will want to limited degrees.

We must also train persons to pay attention and directly tell persons that you mean to cultivate attention in them and to challenge them in a myriad of ways. To a very large degree, all people can be cultivated – even changed into “elites”. Practices should be adopted early on and broadly, and not fully give into demands for “multiculturalism” that might undercut educational efforts.

As Ernst Gellner noted: “Forms of life and cultures, are precisely what thought does not and need not automatically accept. Cultures must not be judges in their own case, as the claim that they 'have to be accepted' would have it. They often fail to be viable and collapse through sheer internal incoherence. ... This seemingly modest abstention from transcendence, in fact here amounts to the immodest, dogmatic and carte blanche endorsement of all and any 'form of life'. (*Legitimation of Belief*, Cambridge University Press, 1974, p. 20)

And yet, as wise as these words might seem to some of us, are they even true? Even if people do not have a foundation for their beliefs, in practice, when it comes to the range of the “forms of life” that are acceptable, do they not nevertheless have some rather firm parameters? For example, nearly all librarians would admit, when pressed, that it is a good thing that we want to discourage some things and some ideas – like advocacy for racism, sexism, terrorism, and slavery, for example – from spreading or being widely accessible. In short, there are some things that are “beyond the pale” and do not even warrant our discussion. Some persons have finally decided that it is simply better to be honest about all of this – one need not agree with their views about what kind of thinking and acting should be encouraged in order to see her point. <http://www.thecrimson.com/column/the-red-line/article/2014/2/18/academic-freedom-justice/?page=single>

It is easier to say something like this when one seems to be going with the flow than against it. That said, sometimes we need to try and hold the line. *Sometimes*, we need to insist on high standards and be willing to die rather than change, confident that the truth of what we are saying will eventually arise again – and perhaps even be more readily realized as a result of the stand we take.

¹⁶¹ Kevin L., Smith. 2014. "Fight or Flight?." *Library Journal* 139, no. 4: 20. Academic Search Premier, EBSCOhost (accessed February 25, 2014).

¹⁶² Bade, David. 2012. "IT, That Obscure Object of Desire: On French Anthropology, Museum Visitors, Airplane Cockpits, RDA, and the Next Generation Catalog". *Cataloging & Classification Quarterly*. 50 (4): 316-334.

¹⁶³ Ibid: 316-334.

¹⁶⁴ For example the library catalogers who have lovingly given attention to the books they have made records for!

¹⁶⁵ Even as Jaron Lanier seems to get excited about automated cars he also seems to be very inconsistent. He says that in "being lulled by the concept of ever-more intelligent AIs", we "are expected to trust algorithms to assess our aesthetic choices, the progress of a student, the credit risk of a homeowner or an institution. In doing so, we only end up misreading the capability of our machines and distorting our own capabilities as human beings. We must instead take responsibility for every task undertaken by a machine and double-check every conclusion offered by an algorithm, just as we always look both ways when crossing an intersection, even though the signal has been given to walk." Lanier, Jaron. 2013. *Who owns the future?* New York: Simon & Schuster, p. 193. Nicholas Carr. Here is where I talk about "under the hood" algorithms in library OPACS and the importance of not losing straightforward search functionality with traditional tools. See some of Thomas Mann's free writings on the web, to better understand what I am talking about here.

¹⁶⁶ Search engine companies, and increasingly libraries as well, are not always eager to encourage critical thinking about all that lies behind the term "relevance". Librarians should know and emphasize that while persons can trust that both Google and library catalogs will help persons to find and recognize good resources, the traditional library systems, contrary to search engines – and now library catalogs to an increasing extent - were able to be understood. As persons like the library of Congress reference librarian Thomas Mann have illustrated, not only can they be extremely effective in helping persons to do research at the highest level – particularly in areas they are not familiar with – but with some education their workings are able, in fact, to be exactly understood.

Consistency and consistent systematization of structured data are something that libraries have been fairly good at, even as things are far from perfect. The Siren Servers Jaron Lanier speaks of are fundamentally about customization and "information asymmetry" (for example "differential pricing", Lanier, Jaron. 2013. *Who owns the future?* New York: Simon & Schuster, 63). Libraries, on the other hand, must offer to all who would endeavor to use them for serious research (one of their essential functions!) a consistency that can be learned by all and depended on. Cataloging, classification, and other organization come into play here.

I also submit the following detailed evaluation of LCSH, utilizing and updating an older email that I once sent out:

One might say that keyword searching without utilizing LCSH is predictable as well – use the same keywords and you will get the same results every time. But here, we are talking about the various ways predictability comes into play.

The simple question, in my mind at least, is this: can subject headings, if they have been thoughtfully administered and constructed, reliably help a person to identify most any books (books are still the prize in that they feature the most developed academic thinking) that have been written about a certain topic that a given library or library consortium contains - often within a relatively brief period of time? I argue that, "yes" - they certainly can. I can do that right now on any number of topics. This is predictable in a way that algorithmic, "under the hood" searching is not. Again, while it is true that you can get the same results for a specific keyword search over and over again, you still cannot know why you got them or if you are getting all the books and other resources a library contains on the topic.

Second, predictability in the sense of inter-rater reliability within the cataloging community may be brought up. For instance, some might argue that they do not think subject headings can reliably predict how many books in a particular collection are about something, and that this is so in part because catalogers do not interpret resources the same way or assign subject headings the same way.

I partially concede this point – not even catalogers are consistent with themselves! Certainly, some resources are hard to catalog, and there will definitely be a range of ways different people will catalog it - particularly if they are not experts in the general subject (or nowadays language!) the resource is about. So perhaps you can say that my view of the LCSH subject heading system is more the picture of an ideal than it is reality. Fair enough. Catalogers do not always do the best job of representing a resource (note that there will be even more variety in cataloging fiction – traditionally, I think no headings were given to fiction works)

That said, a couple points I would like to make here. First, ask yourself this: how likely do you think it is that even an inexperienced cataloger would mess up the a book featuring a Civil War soldier's story – failing to assign "United States -- History -- Civil War, 1861-1865 -- Personal narratives" when it is called for? I am guessing very few.* Particularly if they are an LCSH cataloger who is an expert in the subject area and knows the headings. The same holds true for many other types of works. Often - not always - cataloging such works fairly consistently will not be a problem. Not only this, when it comes to LCSH in general, I think most all of the labels describe clearly discernible and real things that persons are able to agree exist and have some kind of significance ("inter-rater reliability" again) - even if they do not always think to use the same particular headings (there are fast ways to make sure you don't miss using critical headings to - this and First Search's "related subject headings" search as well).

Second, assuming the above, the system, if it is maintained, is sound, and again, persons can become proficient in using the system because it operates to rules that can be known – consistency is key. I think my point holds even when you consider that the names of subject headings do need to be changed or updated occasionally. As for the new systems, none of us fully grasps the principles underlying the search system - that is always kept secret from us, largely so the companies can compete to keep us as their customer (this is one of the things they use to complete for us).

This is a great discussion, and really illustrates how we as librarians are able to provide this service, which I think is at the heart of what we do as librarians.

* Some observations from the LOC librarian Thomas Mann are appropriate here. In one of his papers ("More on what is going on at the Library of Congress"), he talks about "misreading the evidence on indexer consistency" (on p. 9 and 10 of this article or the article "'Cataloging Must Change!' and Indexer Consistency Studies: Misreading the

Evidence at Our Peril" in *Cataloging and Classification Quarterly*, vol. 23, no. 3/4 (1997), 3-45) and points out the lack of real evidence for the oft-repeated claim that catalogers only have 10-20% consistency for their headings for the same book. Mann asserts that 80% consistency among properly trained catalogers who are using LCSH is a reasonable expectation. Certainly LCSH cataloging is much better than any journal indexing, which I admit is often bad. Based on the "inter-indexing studies" that I think have some applicability to library cataloging, I would say it is surely over 50% overall, and closer to 90-100% when we are dealing with pretty-hard-to-screw-up headings like the one discussed above. Of course unless someone is going to design and do a costly, careful, detailed study of catalogers... we won't be able to pin this down directly. That said, it seems to me a reasonable assumption to make.

-A more technical paper from the LOC dealing with the issue of the value of pre-coordinated subject headings:
http://www.loc.gov/catdir/cpsd/pre_vs_post.pdf

¹⁶⁷ We don't even need to get into linked data here (FAST headings fulfill this function). For now, there seems to be the general assumption that search algorithms and other fancy coding that breaks up existing library records (including to the level of LCSH headings, where the longer headings are broken up) into atomic particulars will increasingly be enough.... And of course, there is still the hope that the structured metadata catalogers produce – or much of it – will be able to be automated.

¹⁶⁸ Parry, Marc. "The Humanities Go Google." *Chronicle of Higher Education*, May 28, 2010.
<http://chronicle.com/article/The-Humanities-Go-Google/65713/>

¹⁶⁹ These are the concerns of Anthony Grafton, a historian at Princeton and president of the American Historical Association. Hand, Eric. "Culturonomics: Word Play," *Nature* 474, June 17, 2011 (published online): 436-440.
<http://www.nature.com/news/2011/110617/full/474436a.html> , doi:10.1038/474436a

¹⁷⁰ These are the persons "behind the curtain" of the culture that we have inherited and that we need to highlight. There is a need to always acknowledge the present persons behind the curtain and there are many giants on whose shoulders we stand. For those who do not appreciate this emphasis note that the fact that we can be critical of the West is an indication of the kind of broad and good cultural norms we have inherited. But perhaps we have gone much too far, cutting off the branch on which we sit.

¹⁷¹ The following article clip is a bit of an ode to books and high quality magazines and gets to the notion of timeless, which seems to me close to the idea that there are essential things that persist and are permanent:

"There are two main sorts of books that people buy: flimsy paperbacks bought in airports on a whim, and beautiful hardbacks bought for "keeps." As one could imagine, the former usually end up at yard sales or secondhand stores—but the latter often morph into a collection. Similarly, people usually buy two sorts of magazines: the cheap, flimsy versions one reads for temporary diversion, and serious-minded publications (like the *Economist* and *New Yorker*) that get saved, collected, and even treasured.

How does a print magazine avoid the trash bins and yard sales of readers? It must not only have good, strong, consistent content—it must also have timeless content, superseding mere paltry observations on the fickle political or cultural atmosphere of the day. Also, magazines that serve as curators—of art, food, or culture, for instance—stand the test of time by serving as a reference book to their readers.

A final note: I'm not sure how long magazines can survive while putting their print content online. It seems that, in order to survive as a print and online entity, they must diversify material enough to entice readers to subscribe. While the ethos of the publication must remain consistent, its print content must offer something more—or at least something different.

It is true that, even with good graphics and content, some magazines may fail. They may not prove as hearty as their book cousins. But one hopes that, with some diligence and ingenuity, they will continue to grace our bookshelves and coffee tables." Gracy Olmstead, "Can the Print Magazine Survive?," *State of the Union blog – The American Conservative*. December 12, 2013, accessed March 13, 2014, <http://www.theamericanconservative.com/can-the-print-magazine-survive/>

¹⁷² Nicholas Carr, "No Exit," *Rough Type* (blog), October 29, 2012, 10:28 AM, <http://www.routhtype.com/?p=2019>

¹⁷³ "[The internet] appeals first, beguilingly, to our wants - immediate gratification and quick mental associations - long before it engages the need for the slower processes of deliberative and critical thought... We have a lot of work to do to help our users become more critically aware of the difference between a vague information want, superficially met, and a more focused information need that is deeply satisfied. So far, we seem to have focused more on marketing our image than actually providing indispensable service." Isaacson, David. 2007. "commentary - BACKTALK - What's Still Wrong with Reference". *Library Journal*. 132 (19): 41.

¹⁷⁴ To talk about the "liberal arts" really means to talk about the arts "suitable for a free man." They are "the areas of learning that cultivate general intellectual ability rather than technical or professional skills. The term liberal arts is often used as a synonym for humanities, although the liberal arts also include the sciences. The word liberal comes from the Latin *liberalis*, meaning suitable for a free man, as opposed to a slave." *The New Dictionary of Cultural Literacy*, Houghton Mifflin. Boston: Houghton Mifflin, 2002. s.v. "liberal arts," http://www.credoreference.com/entry/hmndcl/liberal_arts (accessed March 02, 2012).

¹⁷⁵ Lewis, C. S. 1996. *The Abolition of Man, or, Reflections on Education with Special Reference to the Teaching of English in the Upper Forms of Schools*. New York: Simon & Schuster, 67, 70, 81, 80. While he was speaking of scientific practice in general, I think that these comments from C.S. Lewis' book *The Abolition of Man* have particular relevance here - one need not think that most all of today's elites are consciously trying to condition and enslave the masses to see the point Lewis is getting at. His answer to the dilemma is something that he develops throughout the book, the idea of the Tao, which he says is shared by cultures worldwide to some extent: "Either we are a rational spirit obliged for ever to obey the absolute values of the Tao, or else we are mere nature to be kneaded and cut into new shapes of the pleasures of masters who must, by hypothesis, have no motives but their own 'natural' impulses. Only the Tao provides a common human law of action which can overarch rules and ruled alike. A dogmatic belief in objective value is necessary to the very idea of a rule which is not tyranny or an obedience which is not slavery" (pp. 80 and 81).

¹⁷⁶ In this essay "The Borg as Vampire in Star Trek", Justin Everett writes about the Star Trek villain the Borg sucking out one's 'essence' causing a person to become one of them. He expands on this and also talks about Freud's notion of the "uncanny" : "the Borg remove something from their victims, and in the process, introduce an alien substance that transforms them into something decidedly nonhuman. Essence can be taken in at least two ways here: 1) as a literal sampling of human flesh (and in doing this, tasting or eating some part, however small, of the victim); and 2) as removing that immaterial quality that makes humans, well, human. The first meaning is merely a part of the physical process of making a Borg in the Star Trek universe. A relationship of this as an attack of vampiric fangs (and, through penetration, 'rape') is less interesting than its spiritual analogue. As with a vampire

bite, when a Borg injects someone with nanoprobes, that person 'dies' in the sense that his human 'essence' is lost, though the body continues (though it could hardly be called living), obeying not its own will, but that of the Collective, just as the vampire is a slave to its own bloodlust. Thus, like vampires, the Borg represent a contradiction, an uncanny infusing of the alien with the human. It is exactly this kind of irreconcilable intermixing that, in the words of Sigmund Freud, 'arouses dread and horror.'... In Freud's famous essay 'The Uncanny,' he struggles to understand this elusive fear tinged with strange familiarity (or resemblance) that is so changed that something that was recognizable and comfortable becomes a sort of opposite that continues to echo what was familiar in it. Freud uses the German word *unheimlich*..." (p. 82, 83)

Quoting another who talks about the uncanny being a "peculiar commingling of the familiar and unfamiliar, Everett writes: "It is perhaps the word commingling that is most compelling in this description. Without *heimlich*, the familiar, *unheimlich* cannot even be apprehended. It remains alien and utterly without reference. It can only be gazed at in wonder and fear, like glaring dumbstruck into the blinding face of God. Many works of science fiction attempt to relate the sheer awe of encountering something completely unknowable. In film, Stanley Kubrick's *2001: A Space Odyssey* (1968) is perhaps the best known example of this..." He also mentions *Star Trek: the Motion Picture* (1979) and *Star Trek V: the Final Frontier* (1989) as containing examples like this and goes on to say that for the Borg, the "Collective cannot be separated from the *heimlich* individuals that it comprises. For this reason, the Borg, unique in a universe populated with the unknowable on one extreme and the familiar on the other, are uncanny." (p. 84)

Browning, John Edgar, and Caroline Joan Picart. 2009. *Draculas, Vampires, and Other Undead Forms: Essays on Gender, Race, and Culture*. Lanham, Md: Scarecrow Press, pp. 82-84.

¹⁷⁷ *Ibid*, pp 88-89. More: "This is something the Borg cannot do: to choose. Though Dracula's victims do not choose to become vampires, the openness to seduction (the potential for sin, the weakness of will) that many victims demonstrate leads them into the undead state in which all humanity, all freedom of will, has vanished."

¹⁷⁸ For his part, Everett ends his interesting essay by stating the following: "a forked path lies before us. One leads to a future in which science and technology free human beings to become better than they are now, to shape a utopian vision. The other directs us to the end of humanity, a destiny in which humans become slaves of their own mechanical creations." *Ibid*, p. 91.

¹⁷⁹ Questions like "whose history?" certainly have their place here or there, but by no means nullify this deeper point.

¹⁸⁰ Cukier, K., and V. Mayer-Schoenberger. 2013. "The Rise of Big Data How It's Changing the Way We Think About the World". *Foreign Affairs – New York*. 92 (3): 28-40, p. 39.

¹⁸¹ An even more extreme position has been put forth by Anderson (2008), who claimed that as regards researchers using Big data, "data are everything that researchers need and thus...they do not have to settle for models...." See Park, H.W., and L. Leydesdorff. 2013. "Decomposing social and semantic networks in emerging "big data" research". *Journal of Informetrics*. 7 (3): 756-765, p. 757.

¹⁸² It seems to me that the endgame here would be a loss of confidence in the idea of history altogether, as hope for continued "progress" and "human flourishing" dissipates. Our own "humanity" becomes less obvious (the science fiction writer Philip Dick introduces android characters which constantly "destabilize the human characters, making their very humanity subject to doubt"*). While technological knowledge might not be lost, perhaps it is

conceivable that persons would see time more in terms of recurring cycles that never seem to be going anywhere... never having a destination, as it is thought to have now. In other words, “destiny” replaced by “fate”

*Geraci, Robert M. 2007. "Robots and the Sacred in Science and Science Fiction: Theological Implications of Artificial Intelligence". *Zygon*. 42 (4): 961-980.

¹⁸³ I have my own answer to what that wisdom is, and I will start by saying that it is pretty much the opposite of what is contained in this quote:

“I don’t personally have a problem with religious faith, even in the extreme, as long as it doesn’t supersede science and it’s not used to impose outdated mores on others.” He goes on: He goes on: “But some people see our extreme religiosity itself as a form of dysfunction. In a 2009 paper in the journal *Evolutionary Psychology*, Gregory Paul, an independent researcher, put it this way: “The level of relative and absolute societal pathology in the United States is often so severe that it is repeatedly an outlier that strongly reinforces the correlation between high levels of poor societal conditions and popular religiosity.”

Charles M. Blow, “Indoctrinating Religious Warriors,” *The New York Times*, January 3, 2014, accessed Mar. 14, 2014, http://www.nytimes.com/2014/01/04/opinion/blow-indoctrinating-religious-warriors.html?ref=charlesmblow&_r=1

I must admit that I would seek to impress, not impose, my “values” on others (unlike this “liberally-minded” person, who it seems would be much more “Marcusean” [i.e. “repressive tolerance”, after Herbert Marcuse]: <http://www.thecrimson.com/column/the-red-line/article/2014/2/18/academic-freedom-justice/?page=single>): I would say the phrase “reductionism and religion”, should also not be on the “divergent-issue list” that I talked about earlier. Nor do I think E.F. Schumacher himself, the author of the quote and one of the fathers of the environmentalist movement, would have accepted this (he was, to my knowledge, like Jaques Ellul, a fiercely devout and gentle Christian man)

If persons want to continue the conversation with me more, you can contact me at rinne@csp.edu, or get in touch with me via my theology blog, *theology like a child*. You can start by reading this post dealing with the dangers of technology from a theological perspective: <http://infanttheology.wordpress.com/2014/01/10/mankind-has-always-and-always-will-seek-to-reach-three-fundamental-things/>

¹⁸⁴ Freeman Dyson, quoted in Brynjolfsson, Erik. 2014. *Second Machine Age: Work, Progress, and Prosperity in the Time of Brilliant Technologies*. [S.l.]: W W Norton, p. 1.